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MPM

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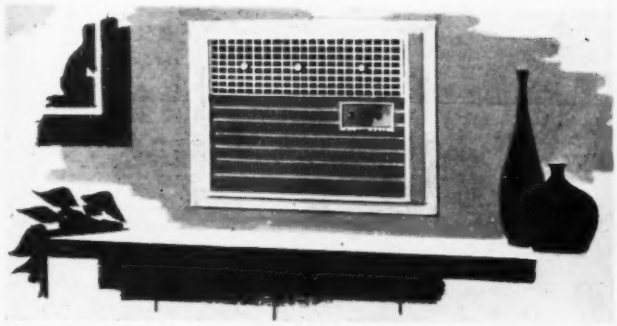

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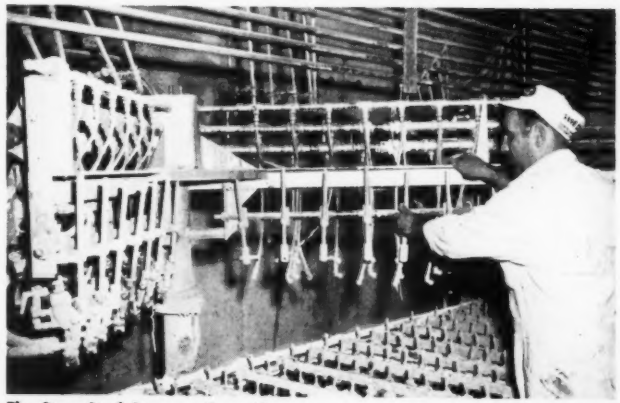

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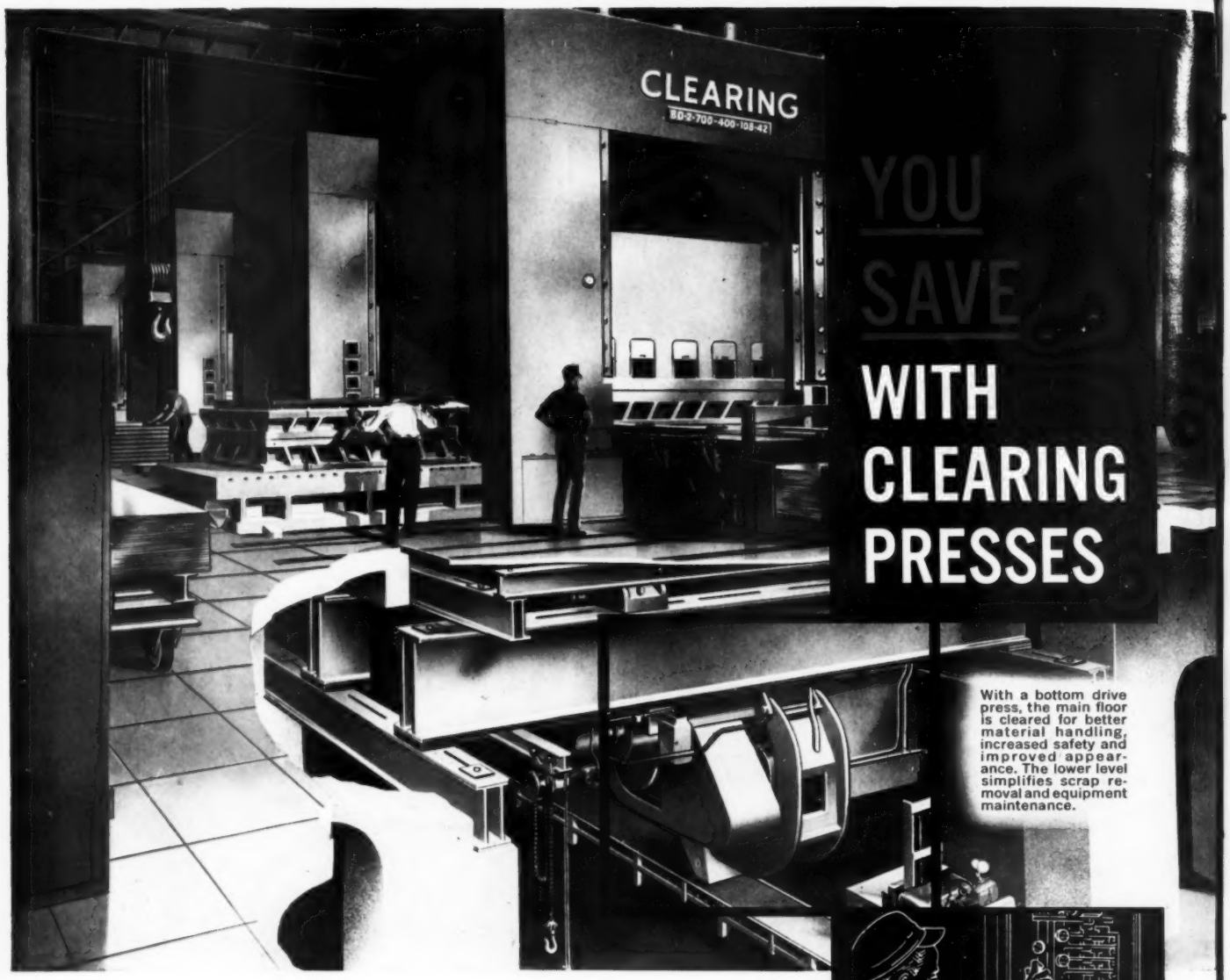
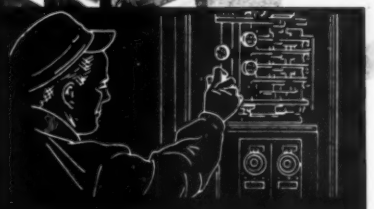
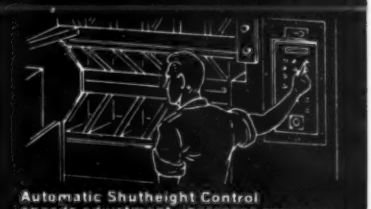


YOU SAVE... WITH CLEARING PRESSES

With a bottom drive press, the main floor is cleared for better material handling, increased safety and improved appearance. The lower level simplifies scrap removal and equipment maintenance.



360° Limit Switch
speeds changeover time.



Automatic Shutheight Control
speeds adjustment, increases accuracy.

Hydraulic Overload Protection
increases safety.

WITH A LINE LIKE THIS...OR A LINE OF TORC-PAC O.B.I.'s—CLEARING PROVIDES THE ULTIMATE IN METAL FORMING EFFICIENCY

Clearing is now building a line like the one above. Presses like these equipped with moving bolsters and the latest features and control devices (as shown at right) are the way to increase profits and production by combatting rising material and manufacturing costs.

Undoubtedly, your production problem is different from the one solved by the press line above. However, whatever the problem—whatever the type or size of press equipment, feeding equipment and dies are best for you—you can rely on Clearing for the most effective solution. Call on Clearing at any time.

Bulletins on Moving Bolster and Bottom Drive Presses are available now.

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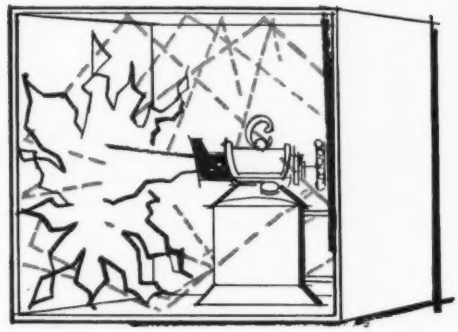
New steels are born at Armco

WITH ARMCO ALUMINIZED STEEL TO HOLD, DIRECT AND RESIST HEAT

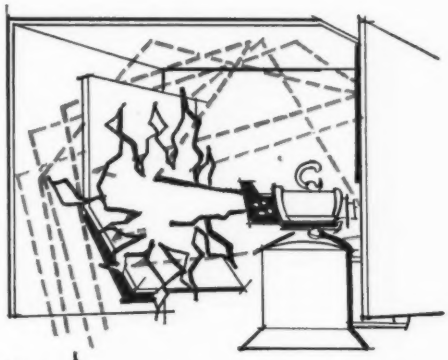
HOLDS HEAT IN

Armco ALUMINIZED STEEL reflects up to 80 per cent of the radiant heat that meets it. When it comes to holding heat in an enclosed area, for example, tests show that an ALUMINIZED STEEL chamber will retain more heat than equal-size chambers of firebrick or porcelain enameled iron.



DIRECTS HEAT

Because it's highly heat-reflective, ALUMINIZED STEEL is often used to put heat where it's wanted in appliances and heating equipment. This reflective special steel also is frequently used to *prevent* concentration of heat where it's not wanted.



RESISTS HEAT

ALUMINIZED STEEL withstands temperatures to 900 F without discoloration, and to 1250 F without destructive scaling. At the same time, it stands up against corrosion.

ALUMINIZED STEEL is lower in cost than any other metal with comparable resistance to combinations of heat and corrosion.

Complete information on Armco ALUMINIZED STEEL is readily available. Just call your nearest Armco Sales Office or fill in and mail the coupon.

Armco Steel Corporation
1480 Curtis Street, Middletown, Ohio

Please send more information on Armco ALUMINIZED STEEL Type 1.

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Title_____

Firm_____

Street_____

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ARMCO STEEL

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Every day . . . truckloads of Kerns Drawing Compounds are routed to satisfied customers. Check these outstanding built-in advantages.

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6. Reduces enameling rejects generally attributed to drawing lubricants.
7. Increases press production.
8. With Kerns ***"DRY-FILM"*** ® metal can be drawn minutes or months after treatment; coating will not deteriorate with age.
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Remember . . . with Kerns you get compounds tailored to your operation.

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METAL PRODUCTS MANUFACTURING

FROM RAW METAL TO FINISHED PRODUCT

A trade publication devoted to the interests of the metal products manufacturing industry with special editorial attention to home appliances. The editorial scope covers design, engineering, market and statistical information and technical and practical information on plant facilities and all phases of manufacturing "from raw metal to finished product." Free controlled circulation to top management, sales management, purchasing, engineering and key plant management and supervision in metal product manufacturing plants. To others, subscription price is $8.00 per year, domestic. To all other countries $10.00 per year (U.S. funds). Single copies, $1.00.

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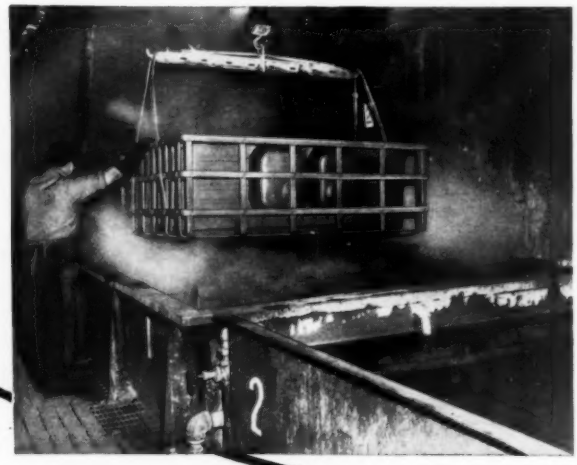
for High Quality PORCELAIN ENAMELING

IT'S A HIGH SPEED CLEANING PROCESS THAT CLEANS SO IT STAYS CLEAN



In enameling, there's nothing so costly and disheartening as rejects. If you are faced with this difficulty—due to unclean metal parts—Mac Chem 1-2 Enameling-Cleaning Process can be of an infinite help.

While we do not claim that Macco Cleaner and Cleaning Process will entirely eliminate all rejects, we do maintain they will reduce them to minimum.

1 Mac Clean No. 20 is a Heavy Duty Cleaner specifically designed to remove all special enameling drawing compounds, etc. It is a fast, easy-to-use, economical cleaner — non-toxic, non-corrosive, and non-injurious to metals.

2 Mac Chem No. 30 is a Second Step, Light Duty Cleaner which removes all residue from the cleaner baths, leaving the metal so chemically clean that it stays clean and readily accepts acid pickle and nickel.

FOR QUICK RESULTS

Write or phone Macco today and have a Macco engineer make a demonstration in your plant. No obligation, of course.

This 2-Stage Metal Cleaning System is serving some of the country's largest porcelain enameling plants. Can be used with equal effectiveness in both automatic and batch type equipment.

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Manufacturers of Better Metal-Working Compounds since 1931

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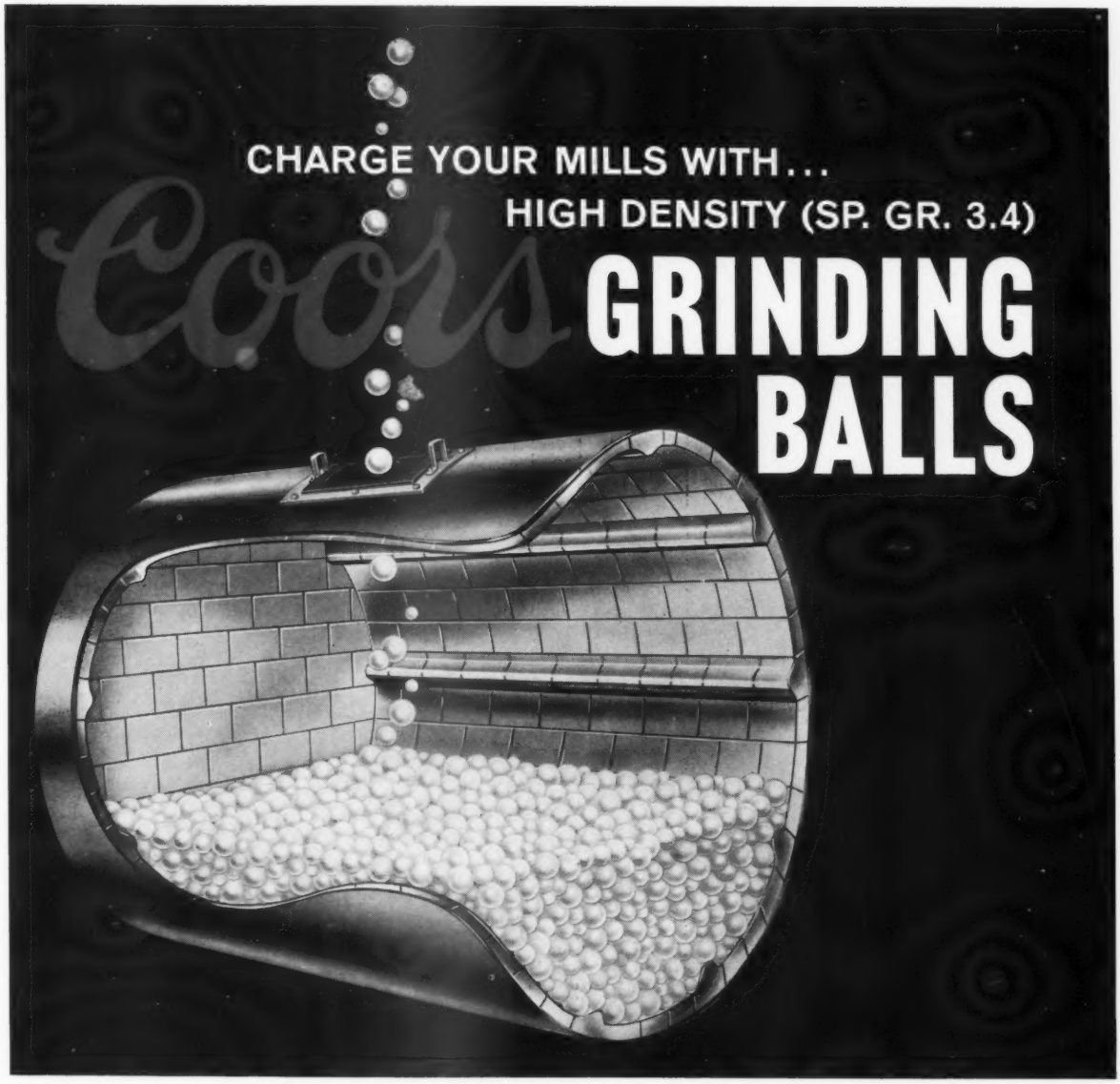


Save Time! Save Money!

REDUCE your grinding time 40 percent or more! Increased grinding efficiency results from the greater weight (Sp. Gr. 3.4) of Coors High Density Grinding Media.

INCREASE production of existing mills by taking advantage of the reduced grinding time—or you can increase the batch and get more volume from your mills on your present grinding schedule.

IMPROVE milling results—by operating your mills at lower temperatures, by eliminating excessive amounts of unground material, by making it easier to clean the media and by getting longer wear from the media and the mill lining.

We shall be glad to give you our recommendations on how to achieve these results if you will write to us on your company letterhead and describe your operating problem.

COORS PORCELAIN COMPANY

600 NINTH STREET—GOLDEN, COLORADO

Manufacturers of High Density Grinding Media and Mill Liner Brick.

From foundry cores to flower pots, Hevi-Duty ovens produce clean, uniform results

It makes no difference "what's in the oven" — all products benefit from the cleanliness and uniformity of performance of Hevi-Duty units. Further, while this uniformity benefits your products, you benefit from Hevi-Duty versatility.

Hevi-Duty offers the largest and most complete line of ovens and other heat processing equipment in the industry. There is a size and type oven to fit your specific requirements, and adapt to your over-all operation.

Why not ask your Hevi-Duty systems engineer to study your operation and recommend the unit that would be most efficient for you. He will be glad to to do it without obligation. There is a Hevi-Duty office near you.

HEVI-DUTY

Electric and Fuel-Fired Industrial Furnaces and Ovens

B P C

A Division of Basic Products Corporation

Hevi-Duty Electric Company, Milwaukee 1, Wis.

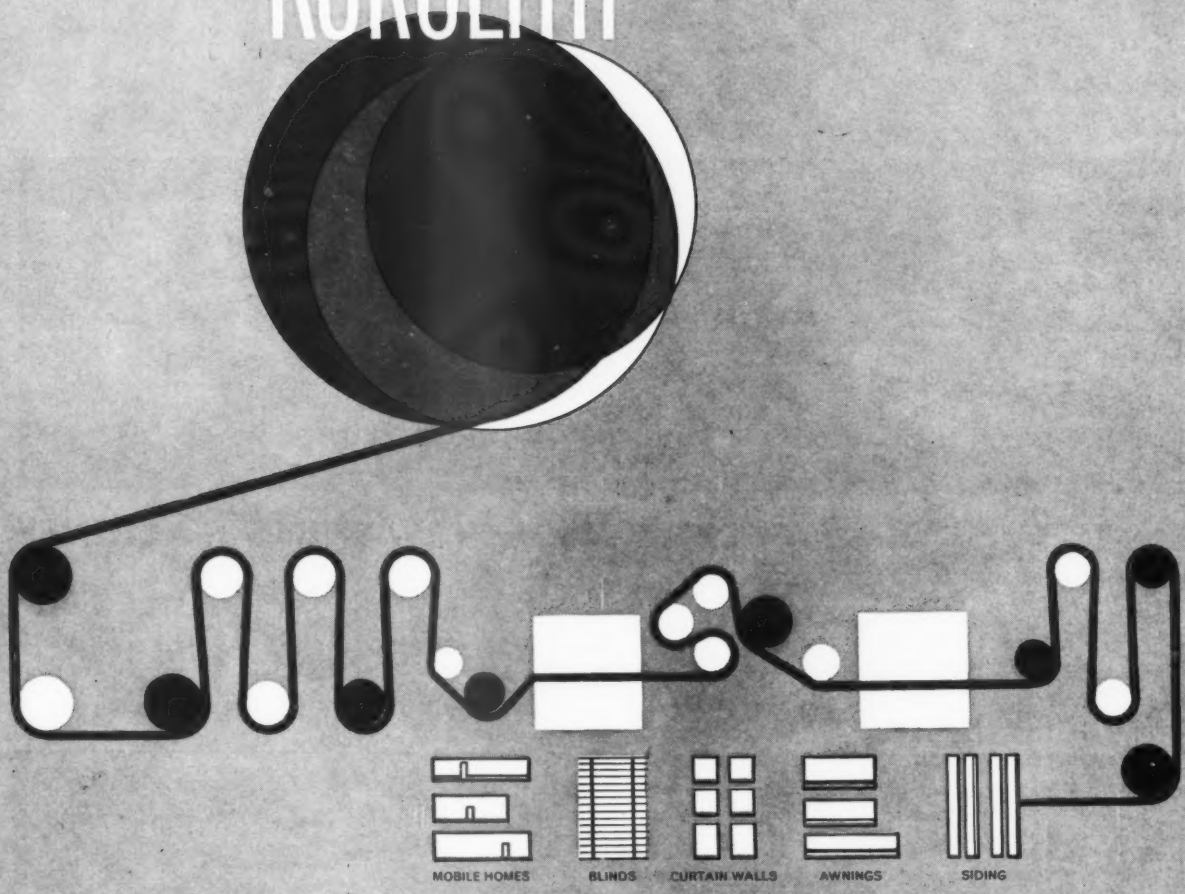
This Hevi-Duty Oven bakes cores for sand casting brass bushings and gears at Bucyrus-Erie Company, South Milwaukee, Wisconsin. The finished parts will be used in the world's largest power shovel. This oven more than matches the output of the unit it replaced, yet it requires only half the floor space. Further, its temperature uniformity and efficient combustion assure clean cores of excellent quality. ***For complete information on this, write for Bulletin 259.***

Stainless Foundry and Engineering, Inc., Milwaukee, Wisconsin, uses this Hevi-Duty oven for drying molds and cores. It operates 24 hours a day, five days a week at 475° F. Its over-all temperature uniformity, excellent circulation of heated air has doubled capacity of the previous unit. Efficient combustion has also resulted in fuel savings, and contributed to the excellence of the finished castings. ***For complete information on this, write for Bulletin 259.***

A unique system of ducts above and below each belt distributes hot air evenly among these three tiers of paper mache flower pots. This oven also dries packaging materials for a large Midwestern container corporation. Built in standard 20-ft increments, it can be expanded to meet any continuous evaporation process by simply adding new sections. ***Please write for Bulletin 159.***

SUPERIOR COIL COATINGS

ACROPON
KOROLITH



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combines the seasoning of experience with the vigor of far-sighted research. Long a supplier of basic coatings and finishes to American Industry, DeSoto has pioneered in new and advanced uses of finishes for metal products . . . tested and proven in DeSoto laboratories, among the largest in the nation. Today DeSoto leads in supplying industry tested coil coatings that retain their original beauty. You can depend on DeSoto coil coatings to withstand the strain of fabrication without deformation, marring, loss of adhesion or formability. In today's swiftly advancing technology, new types of coil coatings are constantly required. DeSoto's vigorous research and production teams all over the country* are maintaining our tradition of looking into the future—and being ready for each new challenge from American Industry. Our field engineers will gladly call to give you the details on ACROPON, the proven thermosetting acrylic featuring maximum durability, excellent forming properties —and KOROLITH, a superior baking finish for specialized end uses.

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DESOTO CHEMICAL COATINGS, INC.

1350 S. Kostner Avenue, Chicago 23, Ill., Phone ROckwell 2-5000.

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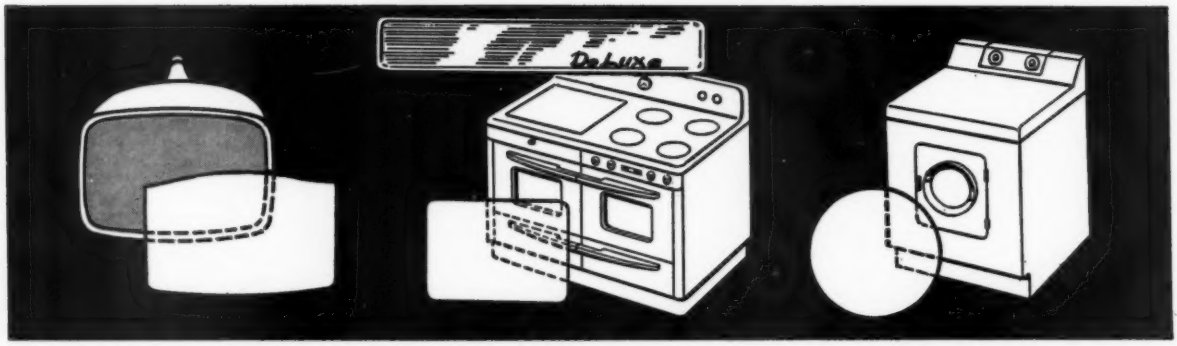
Glass



for TELEVISION • MODERN RANGES • WASHING MACHINES

Let MARSCO'S Craftsmen-Engineering Team

IMPART TO YOUR PRODUCT ALL THE ADVANTAGES OF GLASS

Here are some of the applications for Marsco heat-treated, tempered and hardened glass parts:

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- OVEN DOORS
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- AIRCRAFT ACCESSORIES
- PHOTOGRAPHIC EQUIPMENT
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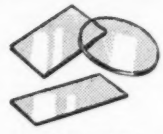
Special Shapes for: Instruments, Gauges, Household and Industrial Appliances.

Marsco

Bent Glass

Convex Glass


Heat-treated Glass

MARSCO MFG. CO., 2909 S. HALSTED ST., CHICAGO 8, ILL.

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...that's *stainless steel*

Stainless Steel is the spotless metal for preparing the food you eat and serve. In protecting the health of your family there is no substitute for clean, corrosion-resistant Stainless Steel.

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Detroit 17, Michigan

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McLOUTH STAINLESS STEEL

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The wire you see in this photograph will make nearly a million machine screws. Yet the rolls of USA-made wire shown here are only a very very small portion of the enormous stock carried in Southern Screw's modern six-acre plant in Statesville, North Carolina. All this stock and all this space mean that Southern's manpower, machines and materials are ready to give "sudden service" to your order regardless of its size.

Southern specializes in fasteners — makes nothing else. This is your guarantee that your fastener problems are Southern's only interest.

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SPRAY PICKLING MACHINES

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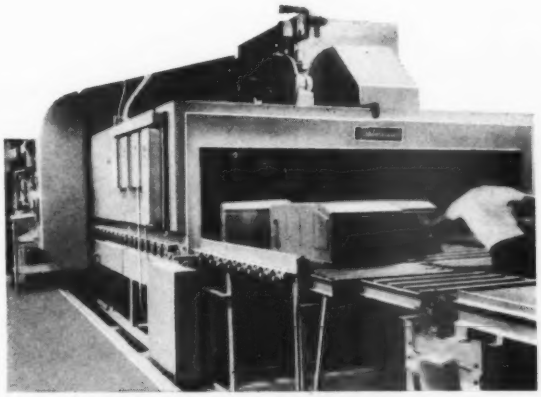
METALWASH conveyorized spray pickling does the job automatically from start to finish—scouring the ware clean of dirt and oxide scale, and performing each step of the pickling process by action of high-pressure sprays which blast the work from every angle.

METALWASH spray pickling does away with the old dip-tank method. Its **automatic** action reduces manpower needs, speeds the job, protects workmen from acids, alkalis and fumes and reduces rejects to a minimum.

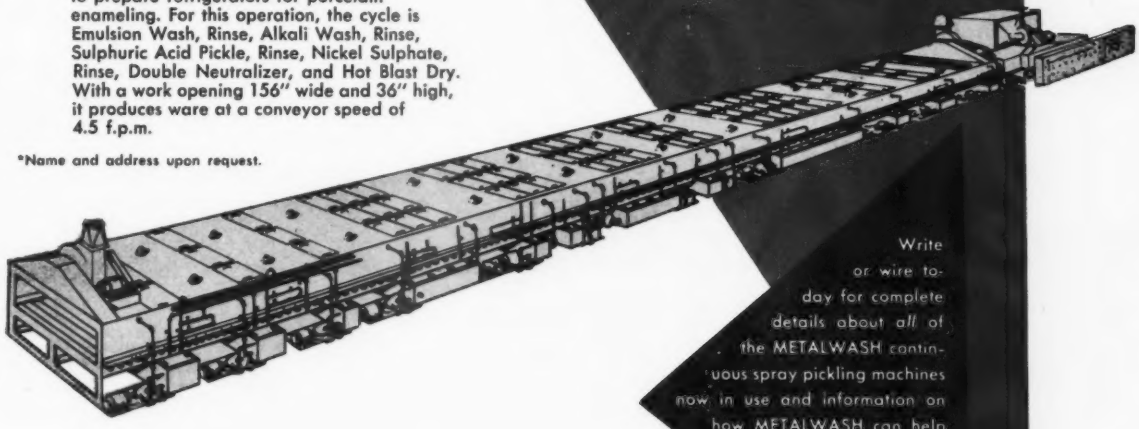
The resulting uniformly-superior surface for application of enamel is obtainable by no other process.



This driven-roller type METALWASH spray pickling machine is used by one of America's largest appliance manufacturers* to prepare refrigerators for porcelain enameling. For this operation, the cycle is Emulsion Wash, Rinse, Alkali Wash, Rinse, Sulphuric Acid Pickle, Rinse, Nickel Sulphate, Rinse, Double Neutralizer, and Hot Blast Dry. With a work opening 156" wide and 36" high, it produces ware at a conveyor speed of 4.5 f.p.m.

*Name and address upon request.

Largest in the world, the 208-ft. METALWASH spray pickling machine shown below was engineered and built for specific application. METALWASH engineers design and build spray picklers in all sizes, of course, and their experience is available to you for production of a machine of any size that will meet *your* requirements.



Write or wire today for complete details about *all* of the METALWASH continuous spray pickling machines now in use and information on how METALWASH can help you to make a better product at lower cost.

Metalwash® MACHINERY CORPORATION

Established 1926

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No matter what your product, process or problem, Glidden Finishes plus Glidden Technical Service can provide the answer.

How

IMPORTANT

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Competitive markets force accelerated efforts to influence both dealer and consumer— your own brand name becomes a significant factor under such conditions. Perhaps this is why so many major manufacturers are turning to La France for positive product identification. La France, specialists in the field — produces three dimensional die cast name plates and decorative trim in a variety of lustrous metal plated finishes. And La France die costs are as low as $35.00. Be sure the name on the front of your product is equal to the name in back of it . . . forward a sample of your name plate or print, or request to have an original design submitted with a quotation for your approval.

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. . . for the name in front!

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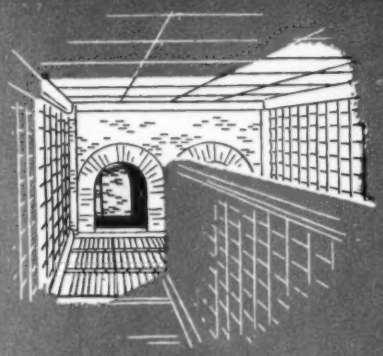
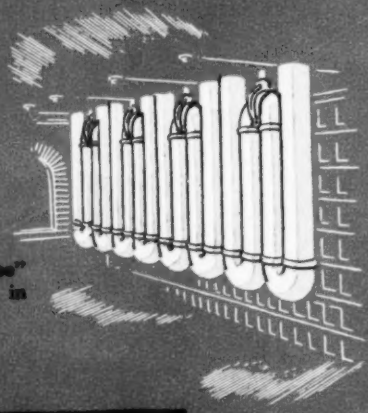
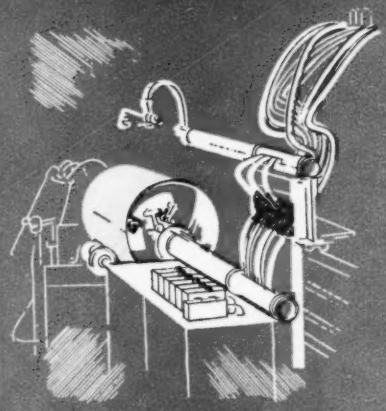


FIRST "U-Type" Continuous Furnace built in 1927, for Enamel Products Co.
...by Ferro



FIRST "Radiant-Tube" Continuous Furnace built in 1937, for Newark Stove Co.
...by Ferro



FIRST Fully-automatic Spray Equipment for water heaters built in 1955, for Rheem Mfg. Co.
...by Ferro

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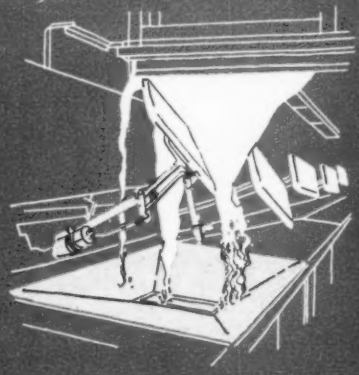
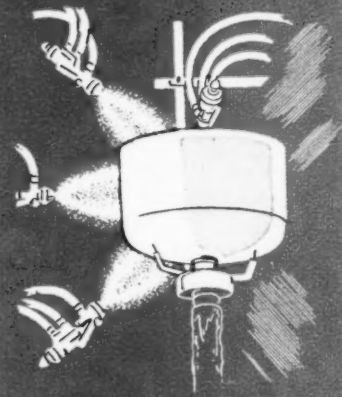
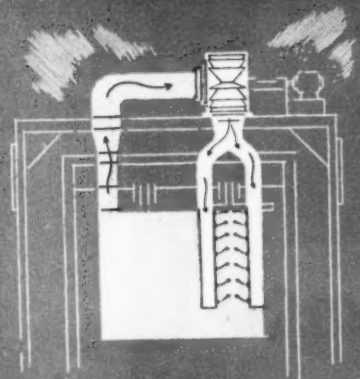


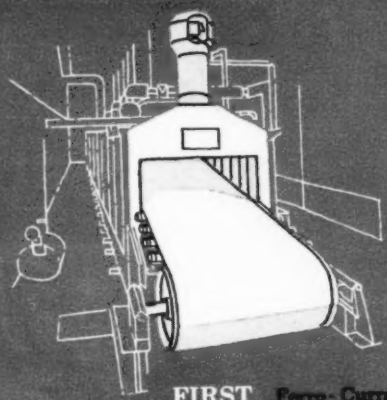
FIRST Fully-automatic Flow Coat Machine built in 1955, for General Electric Co.
...by Ferro



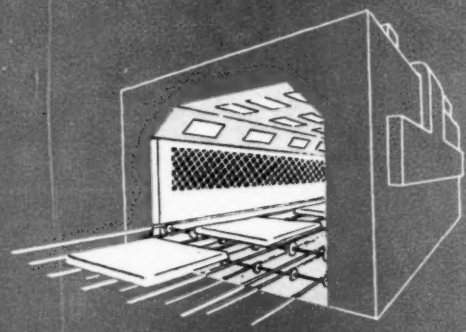
FIRST Fully-automatic Spray Equipment for washing machine tubs built in 1958, for Maytag Co.
...by Ferro



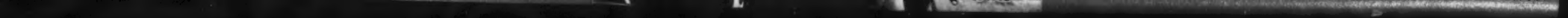
FIRST Porcelain Enameling Furnace with convected preheat air-current system built in 1956, for Porcelain Steel Corporation
...by Ferro



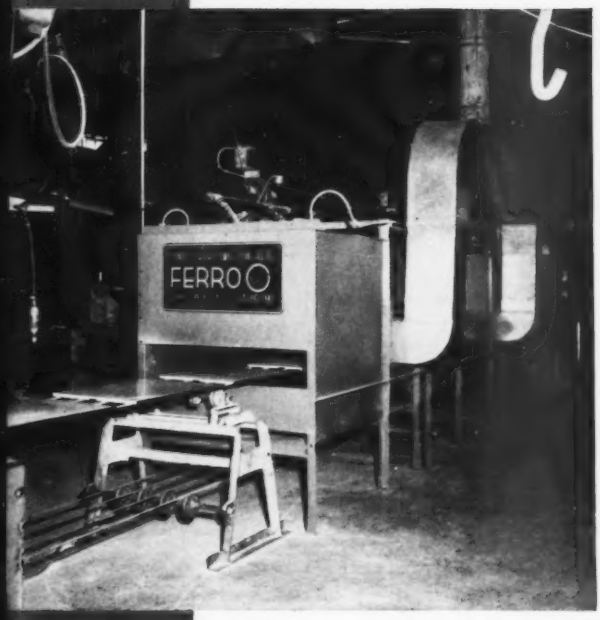
FIRST Ferro-Curran Automatic Spray Pickling Machine built in 1958, for American Radiator & Standard Sanitary Corporation
...by Ferro



FIRST Gas-Fired Infra-red Porcelain Enamel Drying Oven built in 1959, for Murray Manufacturing Co.
...by Ferro



"ENGINEERED-to-the-job" INFRA-RED GAS HEATERS SPEED ENAMEL DRYING



Pioneering new equipment and production techniques for porcelain enameling is a "standard practice" at FERRO. Some are completely new developments, others "adapted" from other industries. One of the most interesting of the latter is the use of FANNON* INFRA-RED GAS HEATERS for *faster, lower-cost* drying of porcelain-enamel ground coats and cover coats. Here are just a few of its advantages:

- Reduces drying time 50% — saves floor space and conveying mechanism
- Reduces up to 50% the gas fuel cost for porcelain enamel drying
- Dries ground coat in 1½ — 2 minutes, dries cover coat in less than 1 minute
- Can be used for lay-down or vertical drying
- Infra-red units heat up and cool off instantly

The first of these installations has now been in use for more than a year at The Murray Manufacturing Company, Tappan Stove Division, Murray, Kentucky. Used for range-parts production, the Infra-red Gas Dryer is 20-feet long, operates at a conveyor speed of 26 fpm with gas consumption of 600,000 BTU per hour.

If *you* can use such savings—in time, money or production space — we'll be happy to show you how an Infra-red Gas Dryer can be engineered to your requirements, your particular type of porcelain enameling production.

**Ferro Corporation is the exclusive representative to the porcelain enamel and ceramic industries for the John J. Fannon Infra-red Gas Heaters.*

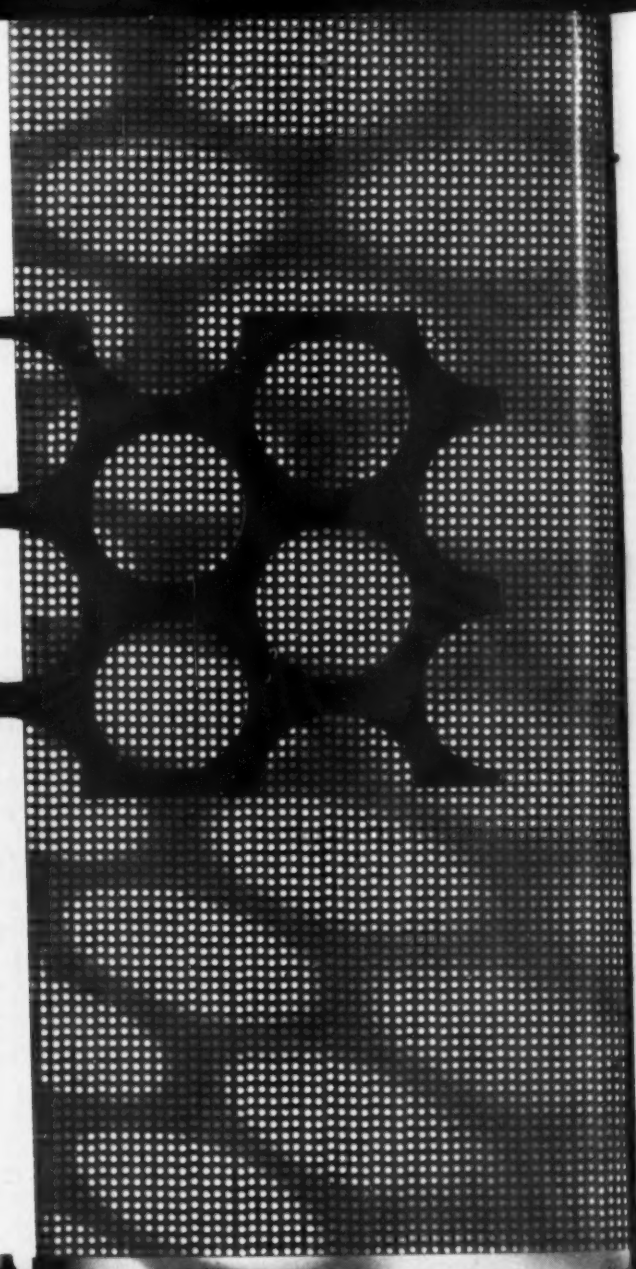
FERRO

FERRO CORPORATION

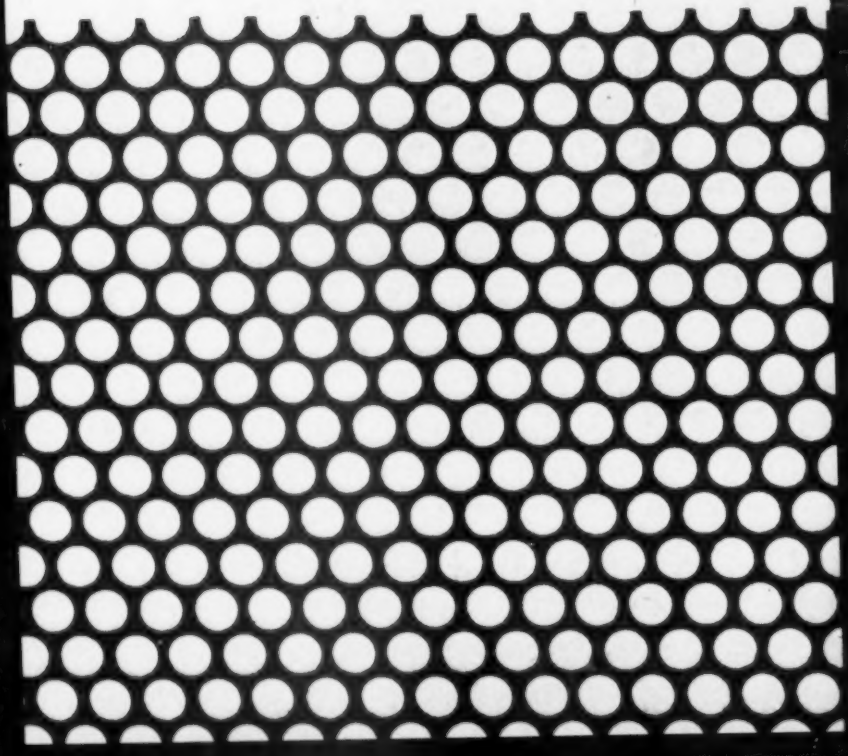
Engineering Division

4150 EAST 56th STREET • CLEVELAND 5, OHIO

H&K



suppliers of quality
perforated materials
to American industry
since 1883



THE Harrington & King PERFORATING CO. INC.

Chicago Office and Warehouse
5640 Fillmore Street
Chicago 44, Illinois

New York Office and Warehouse
116 Liberty Street
New York 6, New York

MPM

editor's mail

The ice maker

Gentlemen: Please send me the tear sheets on the article "Dole Ice Maker" which appeared in the August issue of MPM.

Would you also send the necessary papers which we must complete in order to place our company on the mailing list to receive MPM each month.

Richard E. MacPhaul, Engineer
Springfield Wire and Tinsel Co.
Springfield, Mass.

Wants back issues

Gentlemen: A copy of your July number came into our hands. We are very much interested in this publication, because we are manufacturers of gas ranges.

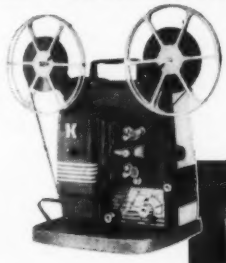
We therefore beg to request you to send us MPM regularly. We should even more be pleased if you would send us the back numbers of this year (from 1st January) so that we can bind them at the end of the year.

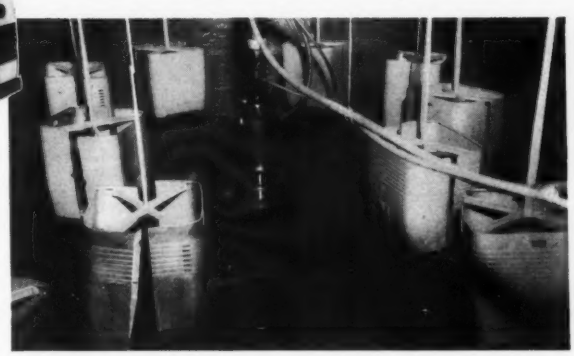
We hope that you will handle our request quickly and, thanking you in anticipation, we remain, Dear Sire,

Apparatenfabriek ATAG n. v.
ULFT — Holland

NO TIME OF YEAR FOR TB. Is there ever a right time? Of course not. But Christmas, more than any other season, should be a time of glowing good spirits, health and happiness. In the fight against TB, it can at least be a time of hope—when millions of Americans help by using Christmas Seals. Answer your Christmas Seal letter today.

KEYSTONE CAMERA
Relies on
RANSBURG
No. 2 Process
Electrostatic Spray Painting
to get the high quality wrinkle finish on cameras and projectors





Projector covers rotate as the conveyor makes a loop around the ceiling-mounted Ransburg No. 2 Process reciprocating disk. Electro-Spray is providing large paint savings on this wrinkle application, and permits Keystone to meet increased production requirements.

Keystone Camera Company, Inc. adheres to a strict quality control program—from start to finish—in the production of their widely-distributed, high quality home movie products. That's one reason for using the Ransburg No. 2 Process to apply a uniform wrinkle finish on their cameras and projectors.

IMPROVED QUALITY AND LARGE PAINT SAVINGS TOO

Together with the improved quality and greater uniformity in their finish, Keystone reports large paint savings over former air hand spray. Rejects which used to run 7%, or more, are reduced to less than 1%. Too, Ransburg No. 2 Process has enabled their finishing department—often a bottleneck in production—to meet steadily increasing production requirements without resorting to expensive overtime. Now, with the automatic No. 2 Process, they can turn out more projector covers in an hour than one operator formerly painted in a day. And, assembled cameras are painted five times faster with Electro-Spray. As a result of these desirable advantages—coupled with even higher production schedules—another Ransburg No. 2 Process unit was authorized for a second, identical production line at Keystone.

NO REASON WHY YOU CAN'T DO IT, TOO

Let us show you how Ransburg No. 2 Process can improve the quality of YOUR painted products, and at the same time, cut YOUR paint and labor costs. Send for our No. 2 Process brochure. Or, if your production doesn't justify automatic painting, let us tell you about the No. 2 Process Electrostatic Hand Gun which can be used in either conveyorized or non-conveyorized painting.

RANSBURG

RANSBURG Electro-Coating Corp.
Box 23122, Indianapolis 23, Indiana

SAVE TIME on the LINE.....KEPS®...SINGLE ASSEMBLY NUT AND LOCK WASHER

If fast, efficient, economical product assembly is vital to your profit picture . . . KEPS are your answer! Nut and washer are applied in one simple operation. Torsion-tightening points on washer provide vise-like grip. When your fastener requirements call for standard or special-purpose bolts, screws or nuts . . . call for National Lock. Our extensive facilities assure uniform quality . . . on-time delivery. Write us.

KEPS, registered trademark of Illinois Tool Works

NATIONAL LOCK

FASTENER DIVISION • NATIONAL LOCK COMPANY • ROCKFORD, ILLINOIS

HINGES • CATCHES • PLASTICS • LOCKS • APPLIANCE HARDWARE • FASTENERS • ALL FROM ONE SOURCE

UNILOY
STAINLESS STEELS

The durable gleam of stainless steel flatware, utensils and kitchen accessories is mighty welcome. Today's homemaker knows and appreciates stainless for what it is—the *one* metal that always cleans fast and easy, never loses that *just-bought* beauty.

Specify Uniloy Stainless Steel. It's the high quality stainless that's easy to work and form. Made by one of the nation's leading specialty steel producers, Universal-Cyclops Stainless is rolled to your exact specifications.

UNIVERSAL CYCLOPS
UC STEEL
STEEL CORPORATION
BRIDGEVILLE, PA.

STAINLESS STEELS • TOOL STEELS • HIGH TEMPERATURE METALS

MOCO Teamwork and Building Block Design Combine to Solve Important Curing Problem!

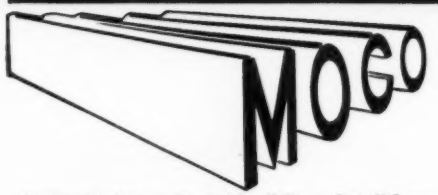
Urgently needing 25% more oven curing capacity for the latest in synthetic rubber products vital to critical Government projects, the Lord Manufacturing Company called on MOCO for a fast, economical solution.

Lord's original equipment had been designed by MOCO with future expansion in mind. Now, MOCO engineers had only to add three walls to the right hand wall of the existing oven, and install heating, ventilating and control equipment.

To meet the target date only a few weeks away, MOCO enlisted the aid of suppliers such as Brown Instrument Division of Minneapolis-Honeywell, Aerofin Corporation, Partlow Corporation, Automatic Switch Company and others. This joint effort, coupled with the versatile design of the MOCO oven, put a brand new piece of curing equipment in the Lord plant—on time, and at lowest cost!

MOCO problem-solvers will welcome the opportunity to team their talents with yours. Write for the name of our representative nearest you.

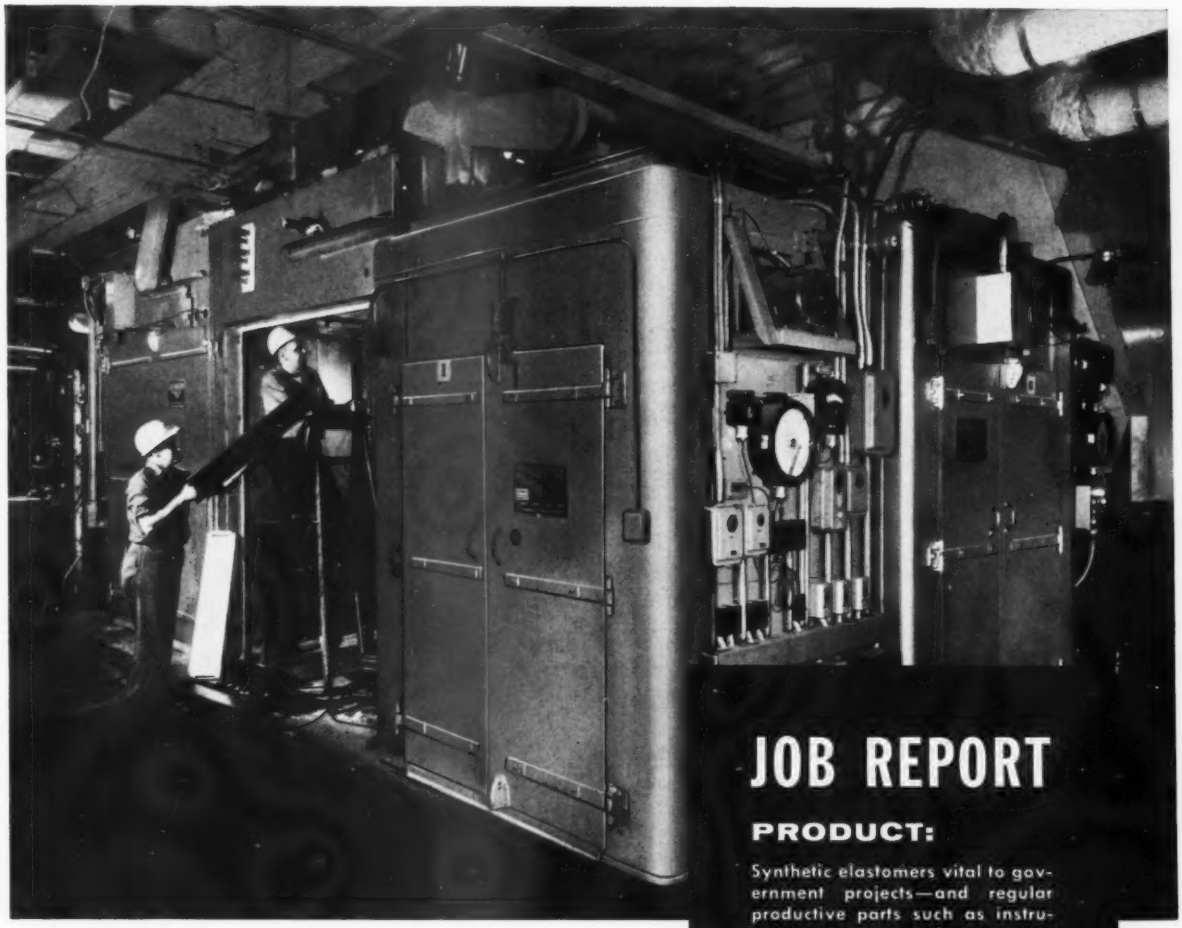
MICHIGAN OVEN COMPANY



FINISHING EQUIPMENT DEPT.
423 BRAINARD
DETROIT 1, MICHIGAN

Washing Machine • Bonderizing Units • Dry-off Ovens • Dip Tanks • Flo-coaters • Finishing Ovens • Conveyors

61-3



JOB REPORT

PRODUCT:

Synthetic elastomers vital to government projects—and regular productive parts such as instrument mounts, engine mounts, components, etc.

PROCESS:

Load rack type trucks in curing oven. Low temperature cure—program controlled 250° F. to 320° F. High temperature cure—program controlled 250° F. to 480° F. Time in oven—Programed, up to several or more days.

PROBLEM:

Increase curing unit capacity by 25% to keep pace with accelerated demand for government classified product. Fixed operational dead line. Low cost imperative.

SOLUTION:

Addition of one new curing oven to existing three ovens, using MOCO Building Block design, with steam heat for low temperature range, supplemented by electric for high temperature range.

FREE—Send for your MOCO bulletin showing typical finishing system applications and specifications; no cost or obligation.

Air conditioner meets corrosion problem

new units by Frigidaire offer solution to problem of salt-air corrosion

AN MPM DESIGN FEATURE

RUST AND CORROSION-RESISTANT room air conditioners, designed especially for areas where saltwater spray and moist salt air constantly ravage metal parts, have been introduced by Frigidaire Div., General Motors Corp.

The new units (one for cooling only, and the other for heating and cooling) are constructed entirely of rust-protected and corrosion-resistant materials which are said to provide longer life and reduce maintenance costs. All parts exposed to the weather are made of anti-rust Monel metal, red brass, aluminum, stainless steel or galvanized steel. Even the cooling compressor is weather-proofed by a protective coating.

Both of the new Saltaire Tuffy units have a cooling capacity rating of 10,100 Btu per hour. The All-Seasons model also has a heating capacity of 8700 Btu per hour. Both units feature two-speed fans, air directional controls and provisions for fresh air intake and room air exhaust.

Parts located inside the room or those not critically affected by corrosion are constructed of galvanized and phosphatized steel covered with two coats of baked-on finish. These parts include the cabinet, control box, evaporator support and cover, and the exhaust air door. A high-grade stainless steel is used for the fan motor shaft and motor mount, as well as for many screws, bolts and nuts. The condenser grille, evaporator end plates and fan blades are of aluminum.

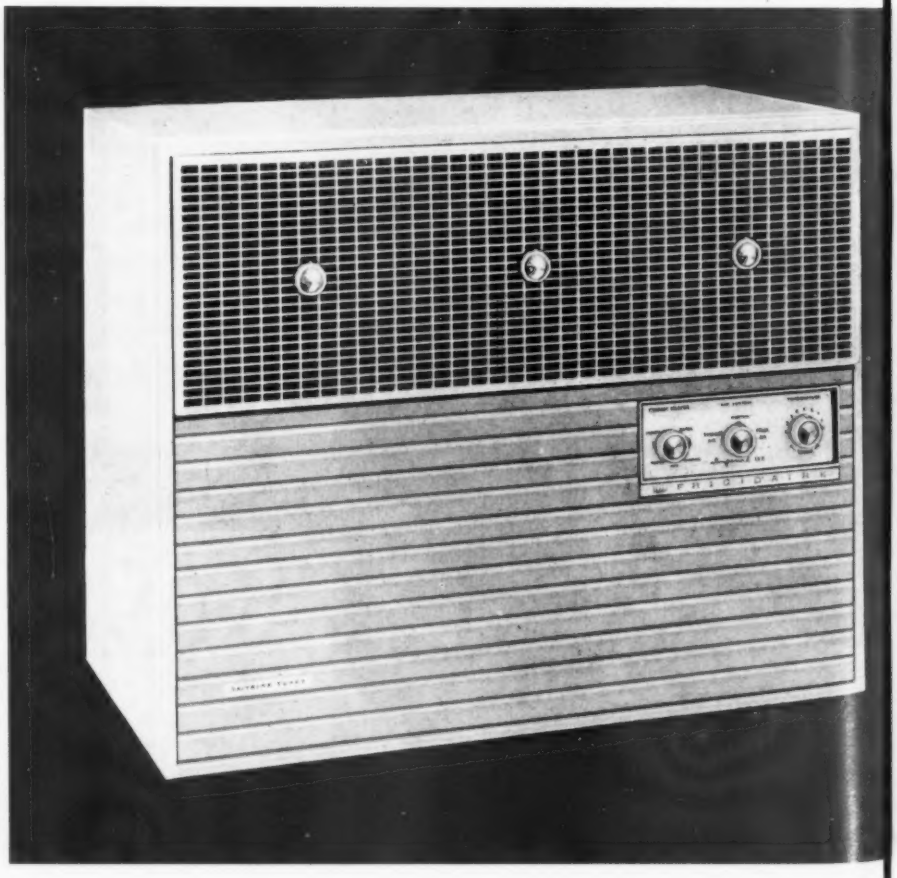
Red brass, a highly weather-resistant material, is used for the interior cover, condenser end plates, and the compressor access panel. Monel metal, which is often used for marine installations to protect oil well towers and radar stations, is used for the center baffle, fresh air door, and condenser end plates.

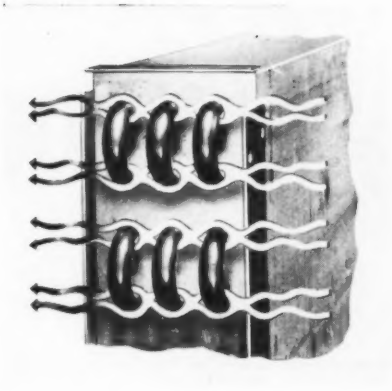
Other features of the units include the "dry-cooling" system for providing extra capacity for dehumidifying a room as well as cooling it, "Fibrous Glass" lift-out filter, and window or "Thru-the-Wall" installation.——————MPM

"Why not give consideration to the use of materials (for air conditioners) with greater resistance to salt-air corrosion — at least for the sea coast markets." This quote is from "The Finish Line" in the May, 1960 issue of MPM, in which Editor-Publisher Dana Chase related the corrosion problems experienced in Florida on air conditioners.

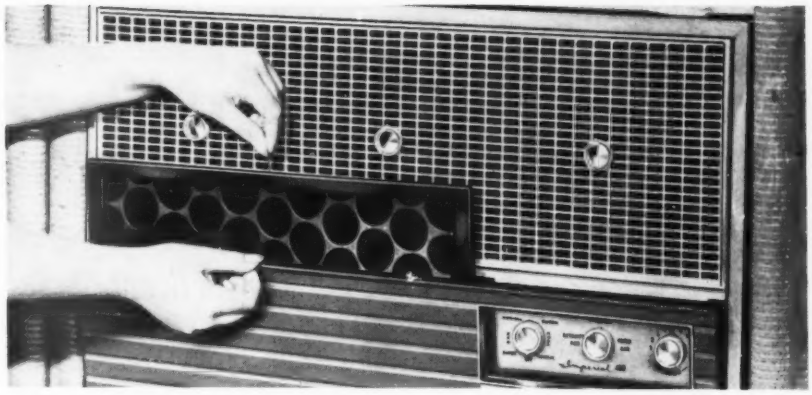
Following the publication of this editorial, MPM was contacted by Frigidaire and informed that a corrosion-resistant room air conditioner had been recently introduced by the company. We hope the Saltaire Tuffy provides a solution to the corrosion problem encountered in "seaside" air conditioning, and in equally corrosive areas elsewhere.

Frigidaire's new rust and corrosion-resistant "Saltaire Tuffy" room air conditioner is designed especially for seaside areas where saltwater spray and moist salt air constantly ravage metal parts. All parts exposed to weather are made of anti-rust Monel metal, red brass, aluminum, stainless steel or galvanized steel. The compressor has also been weather-proofed by a protective coating.

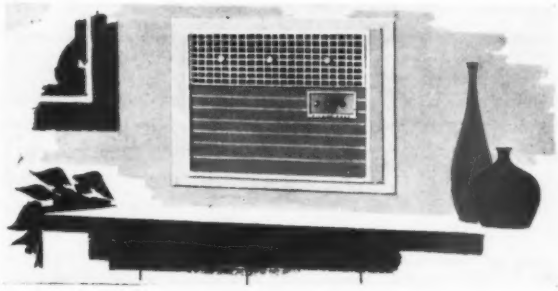




FRIGIDAIRE DRY COOLING

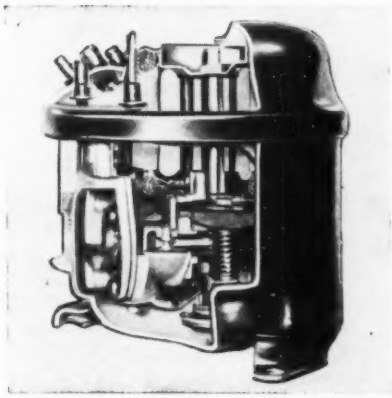


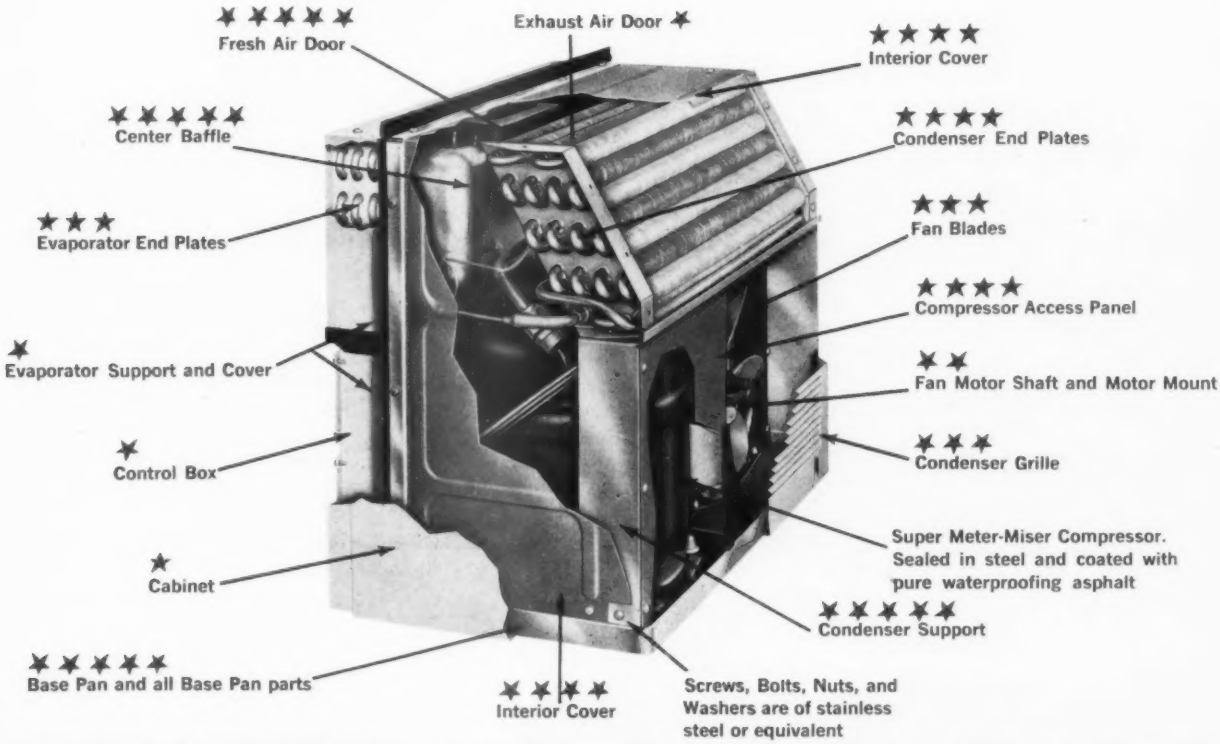
FIBROUS GLASS LIFT-OUT FILTER



THRU-THE-WALL OR WINDOW INSTALLATION

SEALED SUPER METER-MISER COMPRESSOR




★★★★★ Fresh Air Door
Exhaust Air Door ★
★★★★ Interior Cover
★★★★★ Center Baffle
★★★★ Condenser End Plates
★★★ Evaporator End Plates
★★★ Fan Blades
★★★★ Compressor Access Panel
★ Evaporator Support and Cover
★★ Fan Motor Shaft and Motor Mount
★ Control Box
★★★ Condenser Grille
Super Meter-Miser Compressor. Sealed in steel and coated with pure waterproofing asphalt
★ Cabinet
★★★★★ Condenser Support
★★★★★ Base Pan and all Base Pan parts
★★★★ Interior Cover
Screws, Bolts, Nuts, and Washers are of stainless steel or equivalent

★ GALVANIZED & PHOSPHATIZED STEEL ★★ STAINLESS ★★★ ALUMINUM ★★★★ RED BRASS ★★★★★ MONEL

* Has two coats of baked-on finish. Used for parts located inside the room or for those not critically affected by corrosion.

Which spray method

	Conventional Spray	Hot Spray
IT ALL DEPENDS ON object size and form	Whether it's a missile or a light-bulb filament, conventional spray is practical with its wide selection of nozzle combinations and gun types.	Comparable to conventional spray for versatility and range of service. Permits heavier coating of vertical surfaces without runs or sags—better film build on corners and edges.
Where you paint	Practical almost anywhere, indoors or out. If spraying is prolonged, good ventilation is recommended.	The only method suitable for painting where temperatures are low or fluctuating. Because overspray is all but eliminated by this method, intermittent spraying may be done in the absence of a spray booth.
Requirements of the coating	For average coverage, conventional spray can yield fine quality as well as uniform finishes. Heavy coatings with mastics are attainable.	Provides much heavier film build using normal-solid-content materials; helps overcome blushing of lacquer; maximum flow-out minimizes orange peel. Excellent coverage of sharp edges and corners.
Film-build specifications	With average-viscosity paints, film builds up to .6 or .8 mils are attained with a single coat. Multiple coats are required for heavier coatings.	A single coat of heated paint frequently achieves twice as much film build as coatings applied by other spray methods. Less shrinkage during drying keeps corners and sharp edges more thoroughly protected with heavier dry film.
Properties of the coating material	Wide selection of nozzle combinations and gun models will handle practically every type of liquid or mastic, including highly abrasive ceramics and other coarse materials.	Lacquers, enamels, and organic materials whose viscosity is reduced by higher temperatures (under 180° F) are best suited to hot spray. Wide range of caps and tips allows selection of any type pattern or width desired. Sprays at pressures as low as 18 psi.
Speed of application	Rate of application is extremely wide to meet average and special needs. Adaptable to automatic processes with multiple guns where high rate of coating is needed.	Comparable to conventional spray in all respects, with added advantage of heavier film builds if desired.

will work best for you?

Airless Spray

Broad, plain surfaces provide the best opportunity for this method. Small objects or narrow surfaces (under 3") reduce efficiency.

Ideally suited for spraying inside cavities or enclosures, and indoors wherever paint rebound may be a problem with other spray methods.

Produces full, wet coats with good film build and coverage, particularly in corners and crevices.

Coating is very comparable to conventional spray for coverage. However, the wetness of the film makes it more susceptible to sags and runs on vertical surfaces.

Well suited for light or heavy liquid paints of relatively fine grind that do not contain abrasive pigments.

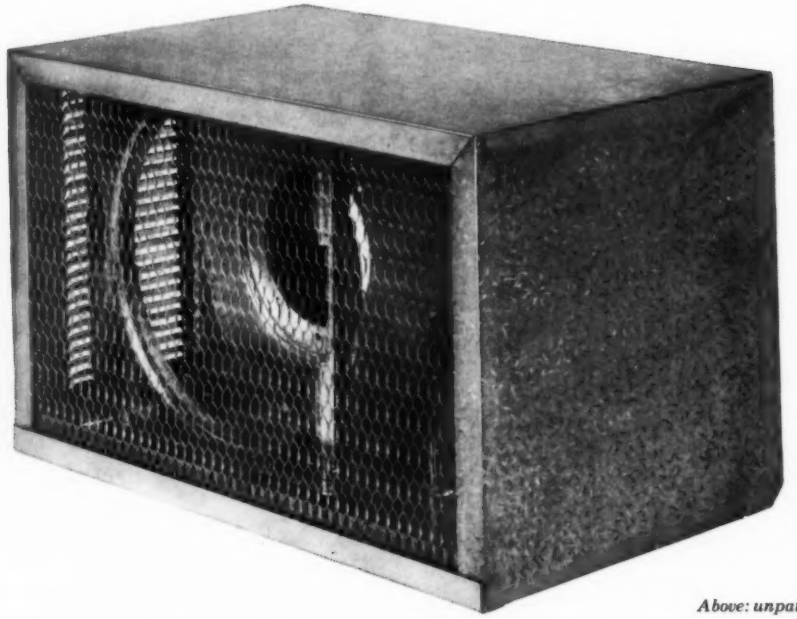
Produces a very large spray pattern for ultrafast coverage of large areas where close control is not a necessity.

An analysis of the job at hand, of the conditions under which painting must be done, of the type and quality of finish desired—all are important factors determining which spray method is best suited to your job.

DeVilbiss, through total service, gives you an unbiased recommendation on the finishing method most economical for you. That's because DeVilbiss designs, manufactures, installs, services, and guarantees all major types of finishing equipment. One source fully qualified to analyze and supply your various needs. Take advantage of total service now! The DeVilbiss Company, Toledo 1, Ohio. Also Barrie, Ontario; London, England; São Paulo, Brazil. Offices in principal cities.

FOR TOTAL SERVICE, CALL
DEVILBISS

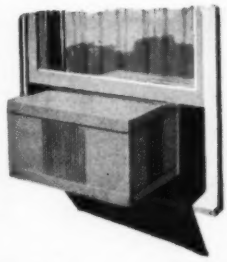
Better Products Through Better Methods and Steels



Above: unpainted air conditioner cabinet

How modern zinc-coated steel sheets keep air conditioners weatherproof—season after season after season.

When cold-rolled sheet steel formed the cabinets and special drawn base pans of air conditioners, they were primed and painted inside and out to protect them from constant exposure and functional moisture. Even so, corrosion often took hold around fastenings, louver edges and scratches.



Now that Weirkote continuous-process zinc-coated steel is used, the cabinet, louvers and chassis can be cut, bent and formed (even worked to the limits of the steel itself) without chipping or flaking the corrosion resistant zinc surface. When the outside paint finish is applied (primarily for decoration) the air conditioner has the double protection of a coating of paint and a coating of zinc assuring corrosion-free service for many years to come.

It's because of this weather-shedding surface, this superior formability that continuous-process zinc-coated steel is more and more the metal specified for air conditioning, heating and ventilating equipment.

A major supplier: Weirton Steel Company—producer of Weirkote continuous-process zinc-coated steel and many other steels that improve products, methods and profits throughout industry.

Look for the STEELMARK on the products you buy; place it on the products you sell.

WEIRTON STEEL
Weirton, West Virginia

Weirton Steel is a division of **NATIONAL STEEL CORPORATION**

Weirkote will also be available in 1961 from National's Midwest Steel Division, Portage, Indiana

AHLMA ANALYZES:

How a satisfied customer gets that way

AN MPM STAFF REPORT

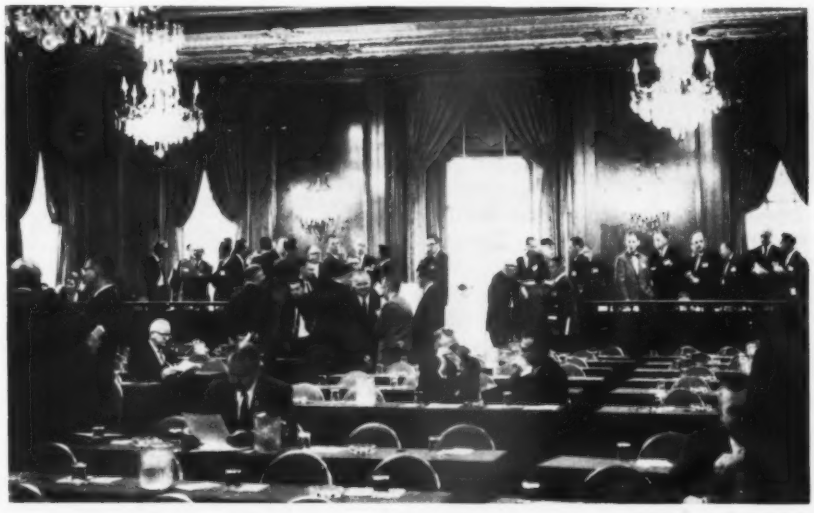
"measuring customer satisfaction" theme of AHLMA's annual parts and service conference

"I CAN ASSURE YOU that the reason customer satisfaction spells success is that it pays off in dollars and cents." Thus George M. Umbreit, president of The Maytag Co., justified the theme of the recent 8th Annual Parts and Service Conference sponsored by the American Home Laundry Manufacturers Association.

The theme — "Measuring Customer Satisfaction" — was explored by eight speakers at the one-day meeting in Chicago's Sheraton Towers Hotel. In order to get a more complete conception of the "satisfied" customer, the speakers' program included representatives from the utility, publishing, and automotive industries as well as from appliance firms.

The program topic and the lineup of speakers proved to be a good drawing card, as a record attendance of over 140 was recorded.

Luncheon speaker Umbreit capped the session with a discussion of what he believes are the important elements of customer satisfaction. His remarks pinpointed three specific elements that Maytag feels are necessary to "create" a satisfied customer: product quality, competent service, and model changes based on genuine product improvement.



(Above) — Maytag President George M. Umbreit addresses Conference at Keynote luncheon. (Below) — AHLMA members relax at pre-meeting coffee hour.
MPM PHOTOS

The question of product quality, he said, is particularly important to the home laundry, because "today's automatic washer may well be the most complicated appliance found in the typical American home." He went on to point out that unreliable equipment is expensive because of servicing and also has a "corrosive" effect upon the customer's good will.

Design for quality

"Product quality begins with design, and I mean design in the broad sense, not merely styling. The manufacturer has a continuing responsibility for emphasis on real design improvements — improvements which may reduce the number of moving parts; improvements which may result in more efficient performance; improvements which can eliminate known service problems; and improvements which can simplify the task of the serviceman when repairs are required."

Umbreit focused the responsibility for product improvement largely on design engineers — not only in designing new products, but in searching for ways to improve existing models. He also recommended that design engineers "get away from their drawing boards" oc-

Another new development using

B.F.Goodrich Chemical *raw materials*

New automatic dishwasher-dryers manufactured by Waste King Corporation, have a tough, resilient, and colorful lining formulated by Michigan Chrome & Chemical Company, Detroit. B.F.Goodrich Chemical Company supplies the Geon polyvinyl material.

Here's the Inside Story...

dishwashers wear a coat of Geon

The tub, door lining, and racks of this new dishwasher are coated with a soft, resilient, and colorful Geon polyvinyl material. It treats housewives—and their dishes—more kindly than ever before. Yet it is tough and abrasion resistant—tests show it will outlast other coatings by two to three times.

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Geon polyvinyl materials are being used for many kinds of coating applications—from metal and glass, to paper and textiles. Geon is a versatile material and is available in many forms for servicing many industries. Rigid vinyl pipe, electrical insulation, house siding and coated steel paneling are only a very few of the many products Geon serves so well. For help on your product idea, write Dept. GD-7, B.F.Goodrich Chemical Company, 3135 Euclid Avenue, Cleveland 15, Ohio. Cable address: Goodchemco. In Canada: Kitchener, Ontario.

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Record attendance of 140 was recorded at 8th Parts and Service Conference.

MPM PHOTO

casionally to observe field problems first-hand.

The next important step in building customer satisfaction, according to Umbreit, is a "very careful and detailed program of testing and quality control." He said this program should include pilot testing in the plant, "breakdown" tests of actual production models, "use" tests under the supervision of laboratory personnel, and finally, home tests. ("I don't know why it should be true, but we have found consistently that when an appliance is placed in someone's home and she is told to use it as if it were her own, all sorts of things happen that never show up in any laboratory.")

Keeping in touch

But Umbreit doesn't leave it at that: "As important as it is, just careful inspection or frequent testing is not enough. It is imperative that the manufacturing division maintain on the one hand a close liaison with the design divison, so that problems arising from design may be corrected; and that they maintain on the other hand a close working relationship with the service department, so that they may take full advantage of field service experience to discover and correct problems as they arise from normal use."

Turning to service, Umbreit stressed Maytag's belief in the service-oriented dealer backed up by a manufacturer-sponsored service training program. In this connection he added, ". . . . . perhaps the most important function — in terms of customer satisfaction — is the training of servicemen. Whether we like it or not, the much-discussed corporate image is often seen by the consumer only in terms of the man who comes to service the product which she owns."

An important phase of good service, he pointed out, is the availability of spare parts. This is one area of the business that cannot be put on a strictly dollars-and-cents basis, he said, because the manufacturer has the obligation of having available parts for all products which he manufactured, as long as there is reasonable expectations that these parts might be needed.

As an example of Maytag's adherence to this policy, Umbreit reported that last year the firm sold five cranks for a wringer on a washer that was introduced in 1919.

On obsolescence

His final point to insure customer satisfaction was that model changes should represent "significant improvements in products . . ." He said annual face-lifting requires constant retraining of the dealer's sales force on new and sometimes dubious sales features, and this tends to destroy the very elements of creative salesmanship which have contributed to economic development.

"We believe that the net result of efforts made by some segments of the appliance industry to utilize the concept of artificial obsolescence has brought about the transformation of the prospective customer to an avid, price-conscious bargain hunter, who is always optimistically confident that she can do better down the street.

"True obsolescence means that there is a real and demonstrable difference between the new models which have been introduced and those which were on the market previously."

He pointed out the difficulty of maintaining high quality standards when new models are introduced every 12 months: "To put it very bluntly — when an appliance manufacturer with several models of automatic washers and dryers in his product line bring out a complete set of new models every calendar year — they come out too fast for 'de-bugging'."

The pre-luncheon session was devoted to the other seven speakers on the program.

Researching satisfaction

E. A. Anthony, consultant, product service, marketing services division, General Electric Co., described his firm's work with a market research program aimed at determining the degree of customer satisfaction in the area of appliance servicing. He stressed the importance of having qualified interviewers undertake the job of ferreting out what the customer actually thinks about appliance service. The results of the extensive survey showed that six factors influence the degree of customer satisfaction:

Sense of urgency: The survey found that customer satisfaction is influenced to a significant degree by the manner in which the request for service is handled by the call taker. The customer expects the call taker to be interested in his problem and to be capable of understanding the situation.

Speed of service: The elapsed time between the initial service request and the *completion* of the service work, regardless of how many visits are required to get the job done.

Availability: The degree to which the service organization extends itself to make its services convenient for the customer.

Dependability: Keeping promises made to the customer.

Technical competence: The competence which the serviceman displays in carrying out his work — whether the serviceman has the parts he needs on his first visit; whether he finishes the service job on that initial visit; and whether the repair job proves to be satisfactory.

Price: This factor is obvious, but Anthony pointed out that although it applies only to service work beyond warranty, customer satisfaction does not appear to be easier to come by when it is done without charge in the warranty period. Customers seem to feel that free service is owed them and no special credit is given simply because that is what they received.

to Page 90 →

Gas burner design data

by Wayne Schulmaat • PENN CONTROLS, INC.

an answer to the combustion problems involved in "compact" heating plants required for the modern basementless home

THE ADVENT of the basementless house brought with it many functional advantages and also many problems not common to multi-story homes or single story homes with basements. Emphasis on increased living areas has resulted in smaller non-living areas of the house. The furnace room may be no more than a small "closet." As a result, heating plants have shrunk with the furnace quarters. The resulting miniature-sized combustion chambers were accompanied by increasing demands for elevated output. Consequently, several undesirable ignition characteristics of gas space heating equipment have been created. This article examines and defines this problem in terms of valve design and suggests a solution.

Manifolds equipped with conventional controls consisting of a regulator and an automatic main gas control valve of a snap-acting type exhibit the ignition-extinction pattern shown in Fig. 1.

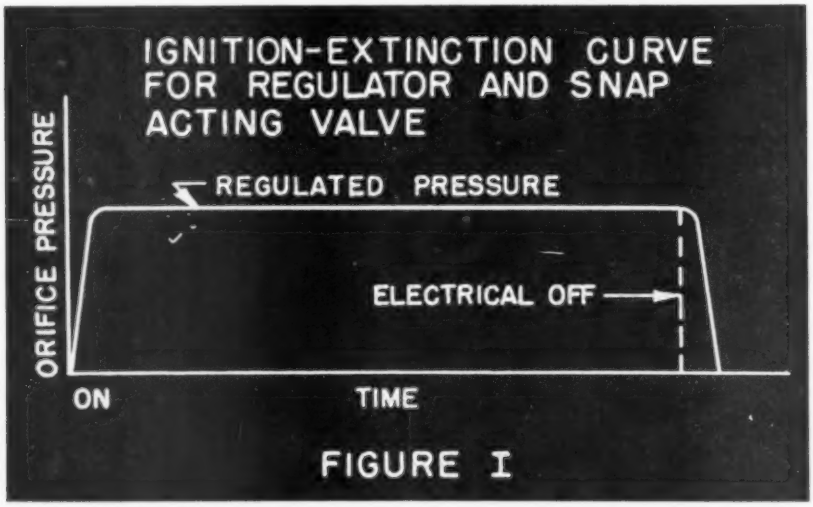

FIGURE I

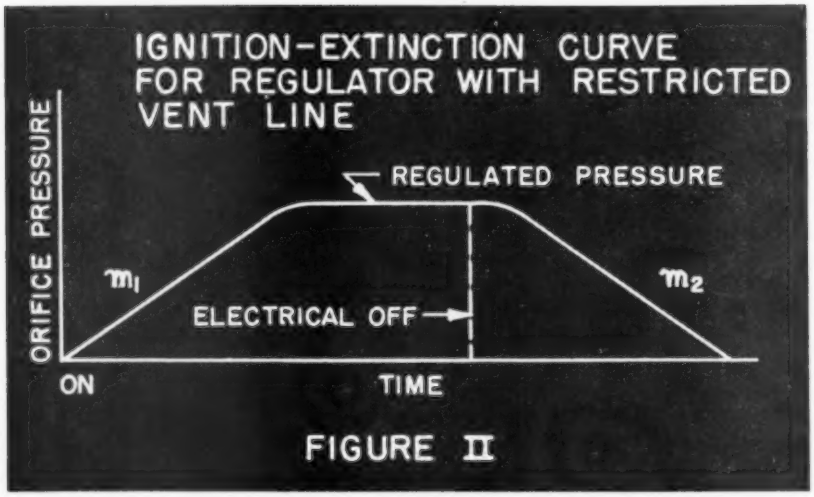

FIGURE II

Flame rollout

When applied to space heating equipment incorporating small combustion chambers, the introduction of too much gas into too little space in too short a time results in an undesirable flame rollout from the secondary air ports. Severe flame turbulence may extinguish the pilot. It would appear logical from examining the performance curve that the slope m_1 is too steep to accommodate the conditions of the combustion chamber and burner.

There are various ways of reducing the slope m_1 of the ignition curve. A diaphragm valve and a regulator are two devices which provide a nucleus about which the reduction of slope m_1 may be realized. Restricting the bleed lines of these devices or any diaphragm-operated device will result in a slower motion of the valve which the diaphragm controls and hence reduce slopes m_1 and m_2. See Fig. 2 for the ignition-extinction curve resulting from restricting the bleed or vent line.

Flashback and "popping"

Consider the valve opening and closing process as being retarded by a restrictor in a regulator vent line. The rate at which the valve opens is determined by the rate of inhalation from the atmosphere allowed by the restriction. An examination of the ignition-extinction curve (Fig. 2) reveals the slope m_1 is reduced from slope m_1 (Fig. 1). An examination of burner performance during the ignition period may reveal that the flame flashes back and burns at the orifice. If by chance it does not, the burner flame will grow in accordance with the rate of bleed established by the restrictor. The setting of the regulator determines the maximum firing rate. The burner will stabilize when the pressure setting is reached.

Extinction of the flame in this system requires the exhalation to atmosphere through the same restricting means which provided inhalation during ignition. If the restricting means is a small orifice, the resulting spud pressure will be that shown along slope m_2 as the restrictor slowly evacuates the trapped air to atmosphere. As the valve slowly closes, it is likely that the burner may emit a loud "pop" as the flame is extinguished.

The attempt to reduce m_1, in order to reduce rollout, has produced the following undesirable characteristics: (a)

flashback during ignition, and (b) a popping noise during extinction. After witnessing these characteristics, it may be concluded that slope m_1 has a low limit below which are produced conditions conducive to flashback, and slope m_2 has a similar low limit below which unwanted noise may appear.

Consider the ignition-extinction curve. A progression beginning at time zero and terminating at regulated pressure offers an infinite number of possibilities. Such a progression describes the ignition characteristics of the burner. Linear and non-linear progressions and combinations of each may make up the ignition curve. It has been established that a restrictor placed in the vent line of a regulator reduces the slope m_1 of the ignition curve. This method of reducing the slope necessarily starts at time zero and progresses continuously in a manner which describes the slope m_1 (Fig. 2).

The hazards of flashback indicate the need to establish initial ignition at a rate in excess of that provided by an ordinary restrictor.

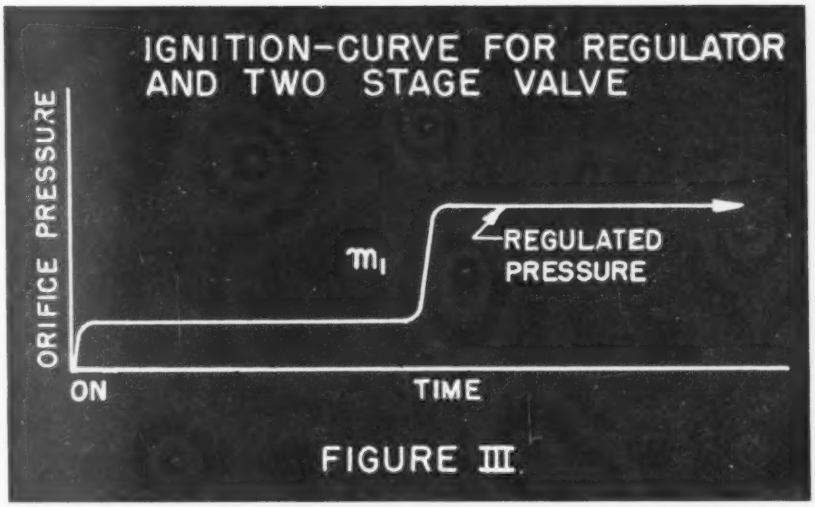

FIGURE III

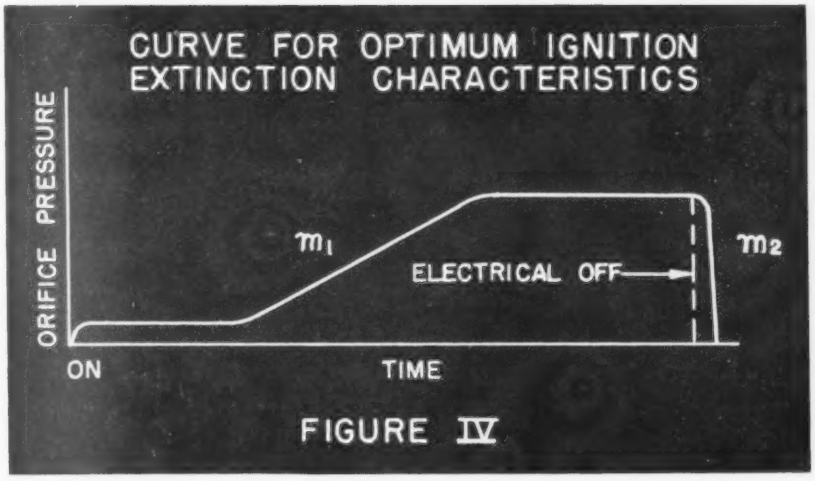

FIGURE IV

Two-stage valves

Two-stage valves normally provide immediate initial ignition. First, one small port opens which rapidly establishes initial ignition. This is followed by the opening of a second port. The equivalent operation may be provided by the partial opening of a valve, followed by full opening. A manifold including a regulator and a two-stage valve produces the following ignition pattern (Fig. 3).

The magnitude of the initial ignition step is readily controllable by sizing the port which feeds the "step"; or in the case of one valve which is partially opened and subsequently completely opened, the magnitude of the initial ignition step is established by the amount of partial opening. Different burners may require different "steps" in terms of percentage of rated input. Many burners appear to ignite satisfactorily and completely at 20 per cent of the rated input of the appliance. Others may ignite satisfactorily at a flow rate as low as 10 percent of the rated input to the appliance.

As the second stage of a two-stage valve opens, the slope of m_1 (Fig. 3) will again determine the size of any rollout. If the second stage is rapid, the probability of rollout exists. As the rate of opening of the second stage is reduced, the rollout will diminish.

Considering the performance exhibited in Figs. 1, 2, and 3, there appear to be at least three areas of the ignition-extinction curve which warrant design attention.

Three areas for design attention

The first area is initial ignition. The second is the slope of the ignition curve, and the third is the slope of the extinction curve. Separate control of each of these areas would appear desirable in order to accommodate the various burner and combustion chamber combinations and conditions.

A rapid small "step" to establish initial ignition removes the possibility of flashback. If the magnitude of the step were individually controllable, the optimum point of intersection of the step with slope m_1 would reasonably be at the lowest spud pressure which satisfactorily ignites the burner. The second area of design attention begins at this point of intersection and ends at regulated pressure.

The selection of the lowest spud pressure which satisfactorily ignites the burner at the point of intersection with the curve of slope m_1 allows the maximum control of the "rollout" section of the curve (i.e., control throughout the greatest portion of the ignition cycle).

Individual design features which adjust or establish the slope m_1 of the ignition curve are obviously desirable; however, it would further appear that the slope m_1 now need be only gradual enough to prevent rollout. A practical length of time measured from the beginning of slope m_1 to 85 percent of the regulated pressure is approximately 6-10 seconds. One-half minute or longer may be satisfactory under these conditions.

The last area of design attention is extinction. It has been established that a conventional restrictor in the regulator vent line retards both the opening and closing of the valve (See Fig. 2). Slow closing exhibits unwanted noise when the burner flame is extinguished. Faster closing minimizes the noise associated with extinction. Separate construction features which permit rapid exhalation of the atmospheric side of

the diaphragm are indicated if a regulator is to be used as the means to control a rapid extinction feature. A rapid "off" time appears to be desirable in any device.

If separate and individual control is attained in the aforementioned three areas of design attention, the ignition-extinction curve (Fig. 4) should result.

This completes one ignition-extinction cycle.

Subsequent cycles

The subsequent cycle is another important area to be considered. A normal subsequent cycle takes place after a period of time. However, an advanced thermostat setting may occur at any time and hence the necessity of considering the subsequent cycle at times other than normal. If ignition-extinction characteristics are tailored to burner conditions according to Fig. 4, it would appear logical to assume that subsequent cycles repeat these characteristics.

If the spud pressure is diminished to a low point during the extinction cycle, at which time the valve is energized, it becomes necessary to accomplish one of the following:

(1) Shut down the burner and then repeat the previously established ignition cycle, or (2) re-establish the firing rate at or below the corresponding low point on the extinction slope (Fig. 5).

A thermal, pneumatic or restrictor type of time delay may prevent repetition of a previous cycle. If properly introduced, no undesirable burner characteristics will result from the time delay. Delays which prevent the burner from being extinguished for a given time and which allow the thermostat to re-energize the valve during this period without the loss of flame do not require repetition of the previous cycle. If the flame becomes extinguished, however, then reasonable repetition of previously established ignition characteristics becomes mandatory. Time delays which introduce the ignition cycle may provide equivalent or reduced delays on subsequent cycles (Fig. 6).

As introduction time (T_1') approaches zero, it is likely that step time (T_2') may also approach zero. Devices incorporating time delays must guard against T_2' becoming progressively and infinitely small. Minimum "step time" for the burner must be considered. In all cases, slope m_1' must remain approximately equal to slope m_1.

After energizing all electrical components, it is normal to expect a flame of some nature to appear on the burner. The absence of flame may create a feeling of uneasiness on the part of a witness. After ignition has been established, a time delay ceases to cause uneasiness and may serve to introduce flame growth. A time delay introducing the initial burner flame does afford the opportunity of clearing the venturi of any combustible mixture. This prepares the burner for a satisfactory subsequent ignition. It is possible to combine time delays with acceptable ignition-extinction characteristics. It is also possible to provide acceptable ignition - extinction without definite time delay.

Optimum performance curve

A review of the conventional manifold performance in Fig. 1, followed by design attempts to improve the ignition characteristics in Figs. 2 and 3, lead to the theoretical optimum performance exhibited in Fig. 4. A valve designed to prove the optimum ignition-extinction pattern reduced the theory to practice. The valve demonstrated both the practicability of controlling each segment of ignition and extinction individually and the versatility of accommodating various burner sizes and conditions. Subsequent cycles exhibit exact repetition of slope m_1 with no risk of rollout as shown in Fig. 5. Although Fig. 6 graphically proposes other satisfactory theoretical combinations incorporating delays, there appears to be little advantage in pursuing more elaborate patterns for today's burners. The performance shown in Fig. 4, produced by construction details which control each important segment of the pattern separately, provides today's burners with the most desirable ignition-extinction characteristics.

New and improved controls to provide better ignition will be designed as changes in burner techniques demand. Controlled stepped ignition is but one challenge to those dedicated to the advancement of the gas appliance industry.

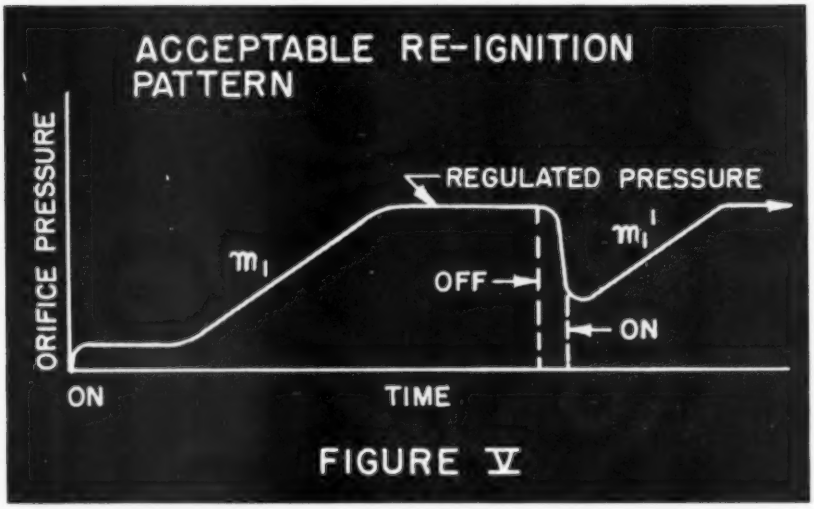

FIGURE V

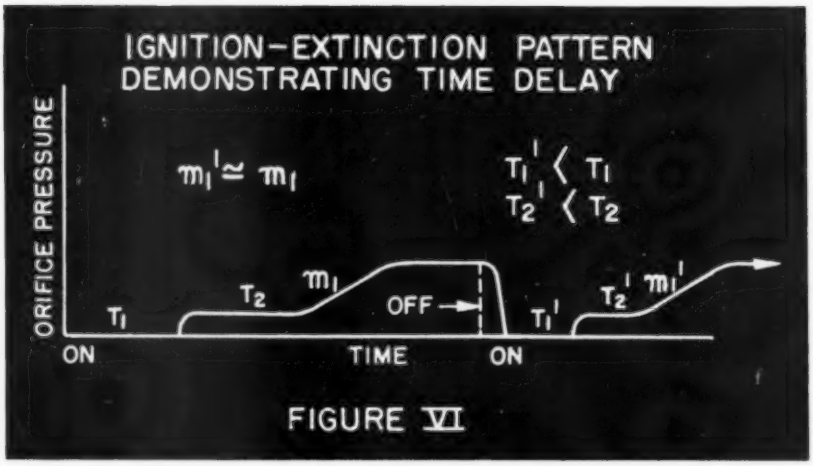

FIGURE VI

EDITOR'S NOTE: *The drawings and information contained in this article were presented in paper form before the Gas Appliance Engineers Society by Author Schutmaat.*

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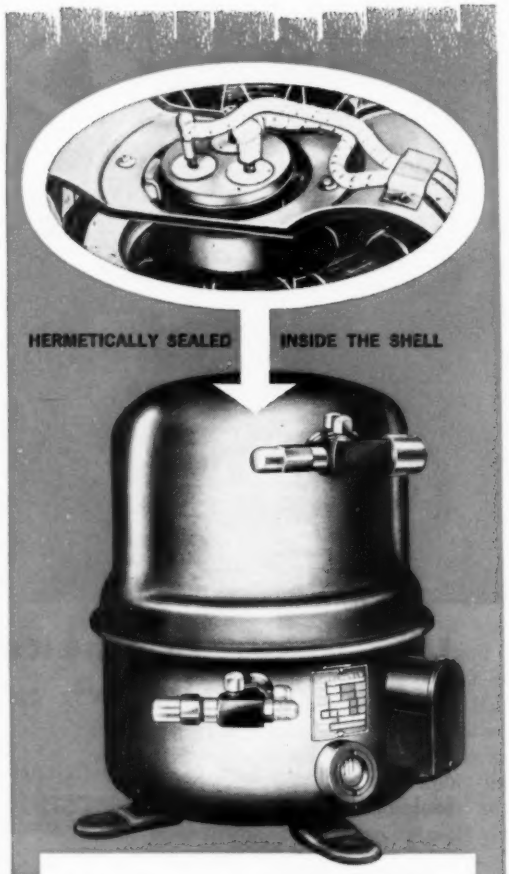

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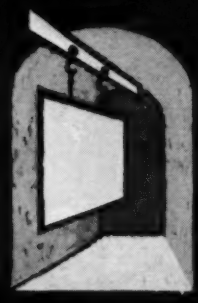

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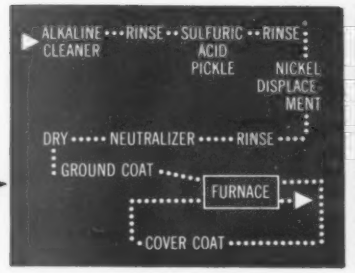

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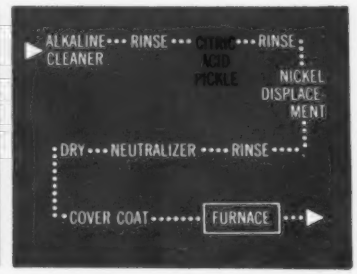

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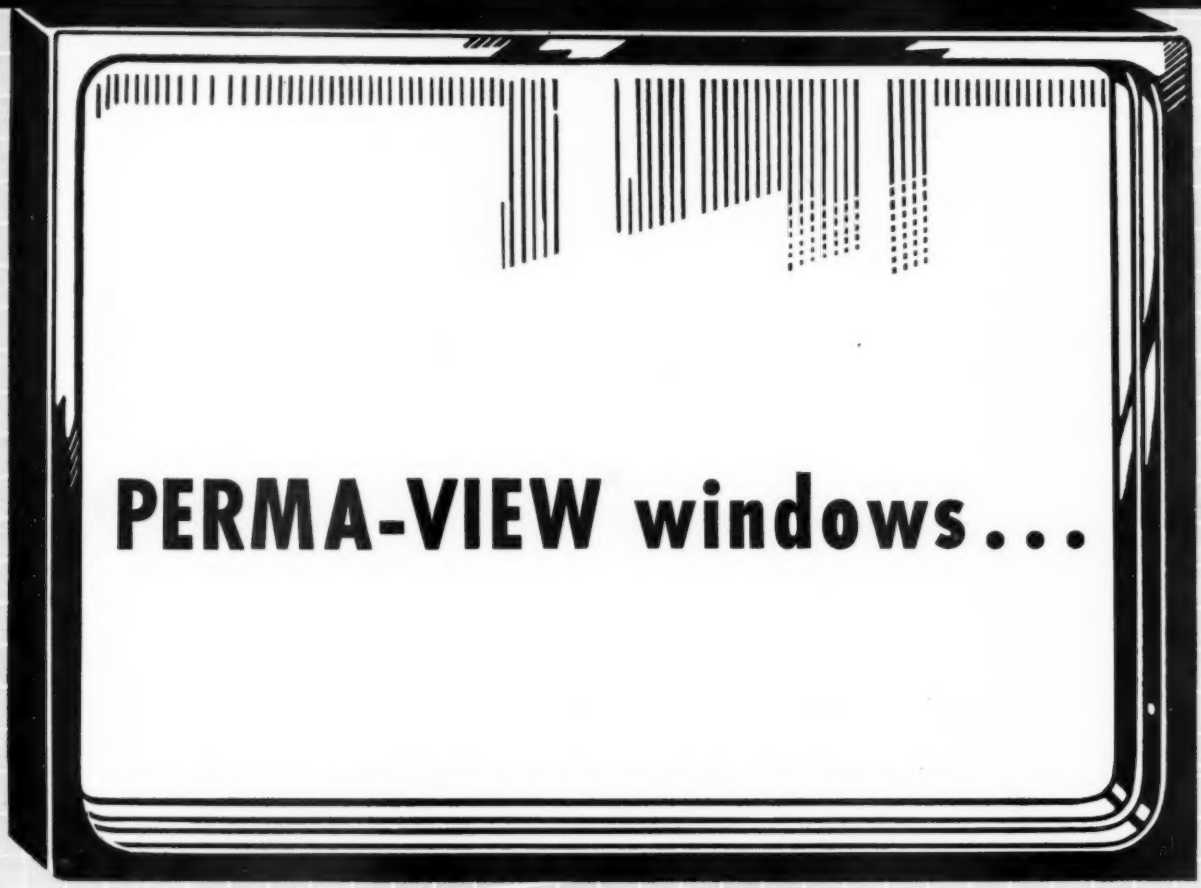

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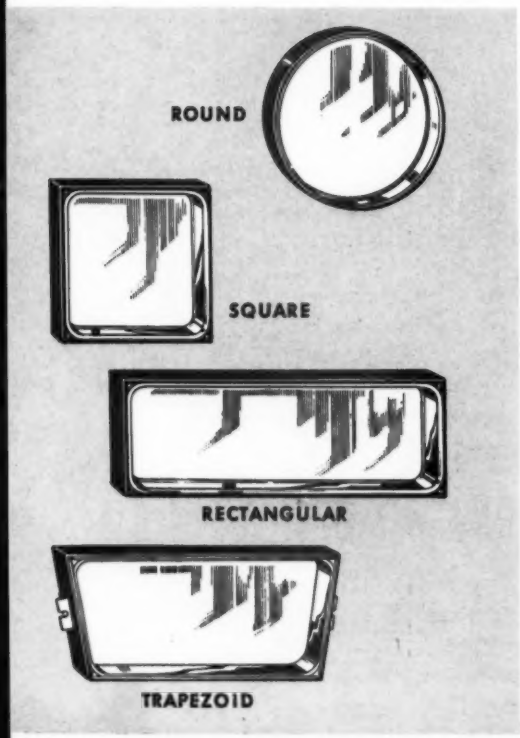

This scientifically designed window, now used in gas and electric ranges produced by leading manufacturers throughout the United States, Canada, and many foreign countries, has now found other practical and useful applications.

PERMA-VIEW windows are now being used for such varied applications as pizza ovens, walk-in coolers, bakery tunnel ovens, commercial roast ovens, and laboratory ovens.

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Mr. John R. Kauffman, President, "Speedster" Inc., Denver, Colorado, states, "The 'Speedster' ovens are doing an outstanding job in the food service-restaurant equipment field. They are widely used for pizza up to 650 degrees Fahrenheit, as well as normal baking operations up to 550 degrees. Mills Products has an outstanding line. Their products are good, and we are pleased with their service, quality, and design . . . they stand out far better than the manufacturer gaurantees."

*3275% SALES INCREASE

Photo courtesy "Speedster" Inc., Denver, Colorado. This "Speedster" baking oven is widely used throughout the restaurant field for pizza and other baking operations.

pizza ovens to laboratory ovens

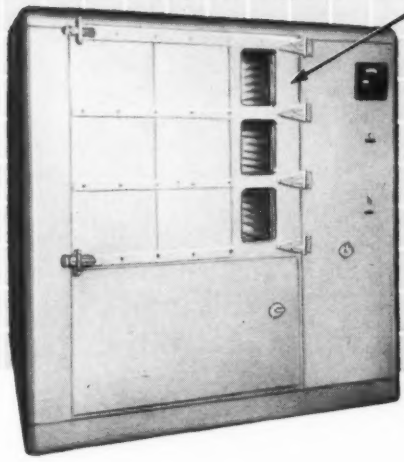

Photo courtesy Despatch Oven Company, Minneapolis, Minnesota. This is a Despatch Saf-T-Bilt laboratory oven, incorporating three PERMA-VIEW windows, precision engineered and manufactured to give exact temperature uniformity and hazard-protection.

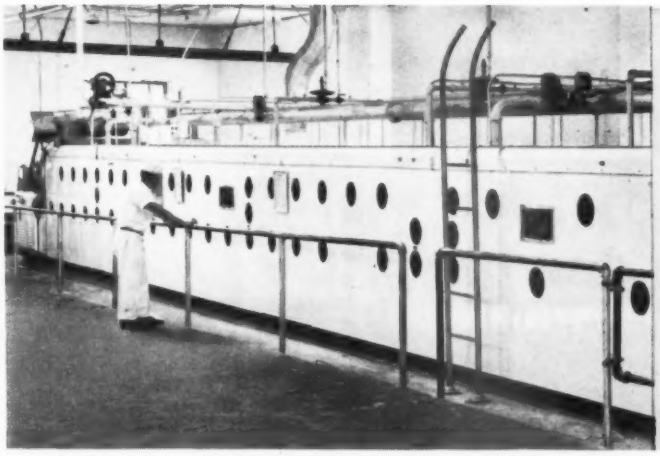

Photo courtesy Baker Perkins Inc., Saginaw, Michigan. This photo shows two PERMA-VIEW inspection windows in the operating side of a Baker Perkins Tunnel Oven installed in a commercial bakery.

Photo courtesy Vulcan-Hart Corp., Louisville, Kentucky. This is one of the Vulcan-Hart electric bake and roast ovens. Part of a complete line of commercial cooking equipment.

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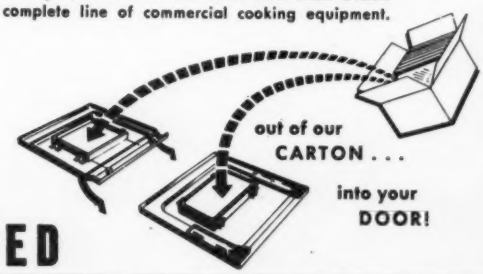

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Porcelain Enamel Institute sets marketing goal

star-studded speakers' group for 29th annual meeting

AN MPM STAFF REPORT

LEADERS IN THE PORCELAIN ENAMELING industry met September 26-28 at The Greenbrier, White Sulphur Springs, W. Va., for the Porcelain Enamel Institute's 29th annual meeting. Speakers for the business meeting represented top talent from the fields of product design, architecture, business management, and merchandising.

The PEI goal, as stated by Robert N. Smith, first vice president and treasurer of Temco, Inc., retiring president of PEI, is to establish new markets while fighting to retain those the group now has. Smith stated that the Institute must have a balanced program, including promotion and publicity, technical and plant processing research, and accounting and cost services.

A display of new porcelain enameled products presented by William E. Pierce, manager product engineering, PEI, had as its principal feature cutaway samples of porcelain enameled exhaust systems for the country's leading automobiles. As reported earlier (see July, 1960 MPM, page 99) American Motors has declared itself in favor of the porcelain enameled exhaust system for its 1961 automobiles.

John Winget is new president

John C. Winget, Armco Steel Corp., Middletown, Ohio, began a two-year term as Institute president. Other officers elected for the coming year include: Robert N. Smith, Temco, Inc., Nashville, Tenn., chairman of the board; J. W. Vicary, Ervite Corp., Erie, Pa., immediate past president; and H. A. Ringelberg, Challenge Stamping & Porcelain Co., Grand Haven, Mich., senior vice president. Other vice presidents elected were A. S. Ault, Chicago Vitreous Corp., Cicero, Ill.; P. M. Corp, AllianceWare, Inc., Alliance, Ohio; and W. T. Porter, Porcelain Metals Corp. of Louisville, Louisville, Ky.

R. H. Turk, Pemco Corp., Baltimore, Md., was elected treasurer, and John C. Oliver was re-elected secretary and managing director of the Institute.

Changing markets

Under the theme, "The Challenge of Changing Markets," Program Chairman Paul M. Corp and his committee presented the following guest speakers: Carl Koch, Carl Koch and Associates, speaking on the subject, "Housing — the Biggest Changing Markets of All;" William L. Mitchell, vice president in charge of styling staff, General Motors Corp., speaking on "Seeing is Selling;" C. D. McMullin, president of the National Appliance Radio-TV Dealers Association, whose talk was entitled "The Challenge of Changing Markets as Viewed by the Retailer;" and John C. Harkness, A. T. Kearney & Co., whose subject was "Have Faith in Your Products."

The "job shop" can't do it

In his discussion of architecture and industrialized building as related to the porcelain enameling industry, Carl Koch pointed to a lack of coordination in in-

to Page 93 →

WILLIAM PIERCE . . .
automobile exhaust systems — a new market

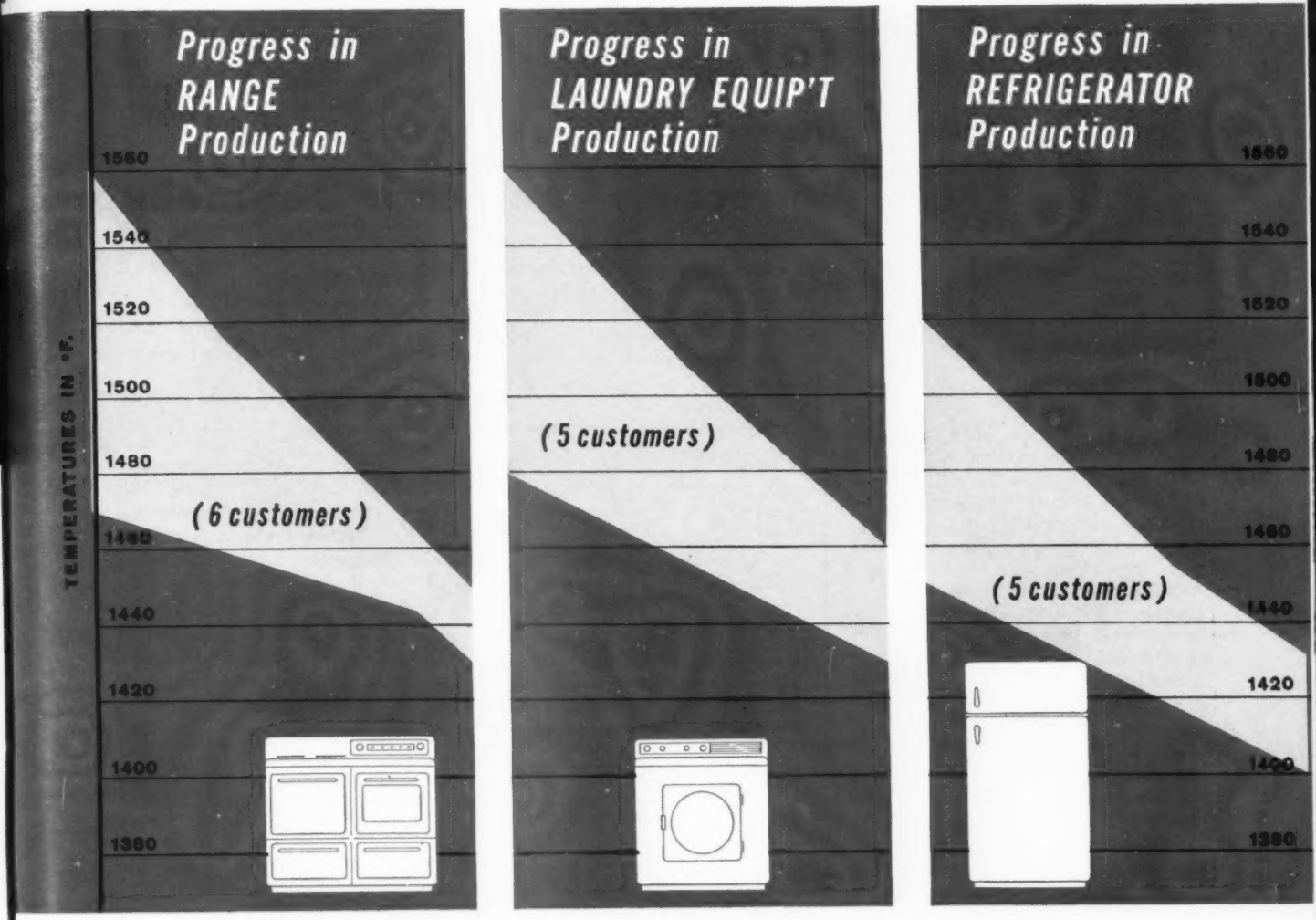
MPM PHOTOS

JOHN WINGET . . .
the 1960 promotional activities will continue

CARL KOCH . . .
the obvious answer is industrialization

WILLIAM L. MITCHELL . . .
the "bizarre — the off beat" is no substitute

Firing Temperatures are coming down..and DOWN



Improve your operations, your profits, with Ferro's production-proved low-temp enamels

Quietly, without fanfare, a minor revolution has taken place in the porcelain enameling industry this past year. Accelerated during the time of critical steel supplies, the use of lower temperature enamels is steadily increasing. Firing temperatures are down—in some instances *more than 100 degrees*—without any loss in quality or production volume.

The change-over in most cases has been smooth, relatively simple. Reason for this, of course, is that Ferro's LOW-TEMP enamels have been in limited use for years, have been production-proved over a long period of time, and only needed to be "adapted" to each customer's plant facilities and production requirements.

Both ground-coats and cover-coats are available, some of the latter with smelted-in color. All are easily workable, with properties comparing favorably with higher temperature enamels.

May we tell you more about them, show you how you can profitably use them in *your* operations?

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Comments on "low temperature" and "direct-on" porcelain enameling

AN INTERVIEW WITH *Jay Simons* • MANAGER OF MANUFACTURING, WESTINGHOUSE ELECTRIC CORP., MANSFIELD, OHIO

EXCLUSIVE MPM PHOTOS

Recent developments in materials and techniques have stepped up appliance manufacturers' interest in "low-temperature" and "direct-on" porcelain enameling. The accompanying bibliography showing MPM's coverage of these subjects for the past 16 years is evidence that low-temperature and direct-on porcelain enameling are not "new" developments. But recent introductions of improved enameling sheets and continuous improvement in frits signal promising opportunities for users of porcelain enamel.

MPM editors arranged an interview with Jay Simons to learn the status of low-temperature and direct-on porcelain enameling in one of the leading appliance manufacturing companies. Westinghouse has worked steadily on these techniques for a number of years. Simons, through his long association with Westinghouse, is well known as an authority on porcelain enameling.

QUESTION — Will you bring us up-to-date on your development and production work in connection with the use of "low temperature" porcelain enamels for steel? (This question relates to maturing temperatures in the range of 1440° F.)

ANSWER — We have been working on this problem, of course, for a number of years, but the work was greatly accelerated last year as a result of the steel strike. We were concerned about the steel situation and greatly increased our efforts to prove out the low temperature enamels on all of our range parts.

By the first of October, 1959, pilot runs and all of the tests that followed had proved to our satisfaction that 1440° F. ground coat and cover coat could be run on a variety of steels we were then using. This included enameling stock, some titanium bearing enameling stock, and cold rolled steel. As a result of this work, our plant went into full production on 1440° F. enamels for all electric range work as of November 1, 1959, and we have been running on this basis in the range plant since that date. Our main reason for lowering the temperature was to make it possible for us to run 100 percent on cold rolled steel in the range plant, with a resultant savings due to standardization. Other fringe benefits that haven't as yet been proved out to our complete satisfaction could be received through fuel saving, longer life or different alloys in burning tools, and less maintenance on furnaces.

JAY SIMONS

Paralleling the early production runs of 1440° F. ground coat and white over assorted steels for range parts, we also made pilot runs on our laundry equipment. We soon found that the dimensional stability of the parts, regardless of the type of steel, easily met our specifications. We also found that the new alkali-resisting enamels developed for the low temperature range worked well in the plant and needed only the required laboratory testing for confirmation of our findings.

We first subjected our alkali resisting tubs to laboratory tests, which indicated that they would be satisfactory, and then further proved these findings with the "lifetime test," which extends over 2,000 hours at a water temperature of 195° F. (In this test, standard denim coveralls with metal buttons are washed in a 2,000-hour run, with standard weekly inspection.)

As an interesting sidelight, when the enameled tub is run to breakdown, the alkali-resisting, low-temperature enamel did not show the same characteristics as the higher temperature enamels formerly run. The higher temperature coatings tend to get a rough or spongy open texture effect at the end of the run, while the newer and lower-temperature, alkali-resisting enamels tend to retain more of their original surface characteristics as they wear through to the metal. Therefore, from the standpoint of the washing machine tub, this would seem to indicate a distinct advantage.

While our results with low temperature enamels have been excellent up to the time of this report, our management at Westinghouse takes the attitude that it is not a foregone conclusion that trouble would be impossible through the use of this system. Our management is prepared, through the anticipation of a big overall saving in the future, to handle any spot troubles which might appear.

Solubility problems which were anticipated have not developed. It does

seem to the plant operators that a little additional care may be required in connection with overspray or reclaim enamel, in order to keep it free of any possible contamination.

Assuming that this system continues to operate to our complete satisfaction, we are confident that it will give us greater stability of porcelain enameled product than we have had in the past, due to the proven greater dimensional stability and a more uniform plant operation.

QUESTION — What has happened to your long-standing program of one-coat direct-on? (Feature articles on this sub-

ject, covering operations at Westinghouse, were carried as early as April, 1950.)

ANSWER — The one-coat, direct-on process has been used for a number of years for all of our range tops, hot plates, and laundromat inner doors. In addition to our standard production, a great deal of experimental work is being carried on with the direct-on process using specialized steels from the four major suppliers who have developments in this area.

It must be admitted that a continuation of production on one-coat, direct-on has been affected by what is now considered to be a more important program — low temperature enamels. We didn't want to be in a position of using specialized, higher-temperature enamels for the parts that were to go in one-coat, direct-on, while attempting to standardize on low temperature for all other parts. Therefore, the direct-on was discontinued on a production basis and is again in a stage for further development work.

Metal preparation for the direct-on process is done at our Columbus plant where complete facilities have been installed for specialized metal processing of this type. This equipment provides for production-size parts so that the metal preparation of our parts is handled in the Columbus plant, and then the ware is transferred to Mansfield for enameling. This applies only to our continued work on one-coat, direct-on.

During the past years, the Westinghouse Mansfield plant has run many thousands of production parts with the premium titanium-type enameling stock in one-coat, direct-on. This was very successful and was continued on a production basis. What our plant management would like to see now in connection with this process is a system whereby it would be possible to use standard enameling stock or one of the new specialized enameling stocks that do not carry the high premium related to titanium-bearing steels.

Naturally, we would also like to see a metal preparation system that would not entail a big capital investment for the plant.

Westinghouse has definitely not lost interest in the one-coat program, because we have been in it too long and spent too much time and effort on it,

and have a good measure of its value because of the long period of satisfactory results that are behind us.

It just so happens that currently the program is "out of phase" in relation to our standard enameling procedures.

At the present time, our company is attempting to re-evaluate all of the available materials and processes relating to the one-coat system, so that we can again chart a practical course that will tie in with our present enameling practices.

LOW-TEMPERATURE AND DIRECT-ON PORCELAIN ENAMELING BIBLIOGRAPHY
***MPM* ARTICLES**

WILL WE HAVE ONE-COAT PORCELAIN ENAMEL FINISHES APPLIED DIRECTLY TO BASE METAL? ..... January 1944
WE BUILT A PLANT FOR LOW-TEMPERATURE CERAMIC FINISHES ..... January 1944
PORCELAIN ENAMELING AND LOW-TEMPERATURE CERAMIC FINISHING ..... July 1944
PROGRESS REPORT ON APPLICATION OF WHITE ENAMELS DIRECTLY TO BASE METAL ..... January 1945
LOW-TEMPERATURE CERAMIC FINISHES FOR HOME APPLIANCES ..... November 1945
LOW-TEMPERATURE CERAMIC COATINGS HAVE MANIFOLD USES ..... May 1946
PROGRESS IN THE DEVELOPMENT OF "LOW-TEMPERATURE" PORCELAIN ENAMELS ..... February 1948
APPLICATION OF COVER COAT ENAMEL DIRECTLY ..... December 1948
TITANIUM ENAMEL DIRECT TO TITANIUM STEEL ..... April 1950
NEW DEVELOPMENTS IN PORCELAIN ENAMELING ..... August 1950
A NEW PROCESS FOR ONE-COAT DIRECT TO STEEL ..... November 1951
EXPERIMENTS WITH WHITE ENAMEL DIRECTLY TO STEEL ..... September 1952
ONE-COAT GRAY SPECKLED TITANIUM ENAMELS ..... October 1953
WHAT IS HAPPENING TO ONE-COAT PORCELAIN ENAMEL APPLIED DIRECTLY TO STEEL? ..... March 1954
LOW-TEMPERATURE PORCELAIN ENAMELING AT CONNERSVILLE, INDIANA ..... October 1956
LOW-TEMPERATURE PORCELAIN ENAMELING AT INGERSOLL ..... March 1958
HOTPOINT LOWERS PORCELAIN ENAMELING FIRING TEMPERATURES ..... May 1958
ONE-COAT WHITE ENAMELS ON COLD-ROLLED STEEL ..... January 1959
ONE-COAT WHITE DIRECT TO STEEL ..... April 1959
A MAJOR BREAK-THROUGH IN WHITE DIRECT-ON PORCELAIN ENAMELING ..... July 1959
THE CURRENT PICTURE IN WHITE DIRECT-ON PORCELAIN ENAMELING ..... December 1959
LOW-TEMPERATURE PORCELAIN ENAMELING AT FRIGIDAIRE ..... January 1960

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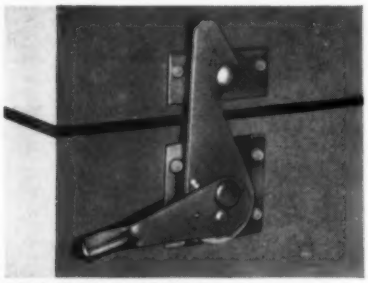
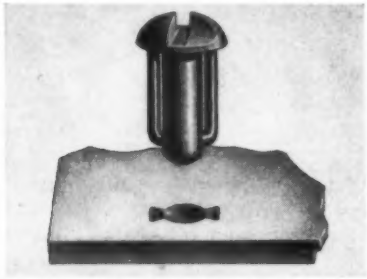
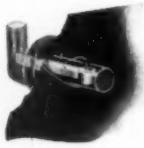


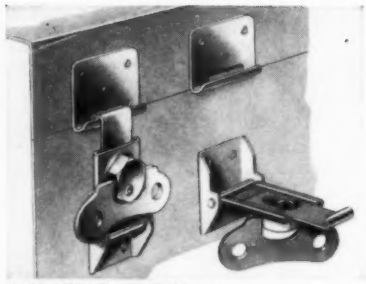
HOOK-LOCK–Springless, positive-locking latch which lies flat against mounting surface, open or closed. Provides high closing pressure and load-carrying capacity. For military as well as commercial container applications.



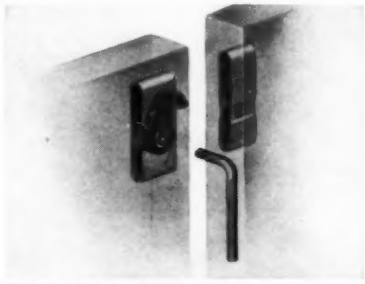
SPRING-LOCK–Perfect, proved blind rivet for removable covers and panels on electric and electronic equipment, sheet-metal automobile parts, appliances.

Plastic Spring-Lock Shelf Supports with "heart of steel" help refrigerator makers cut costs, speed production, simplify servicing.

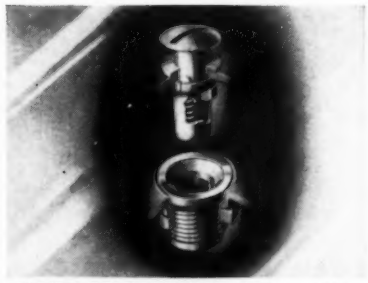




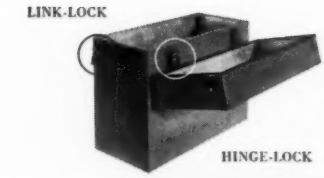
LINK-LOCK–Ideal latching device where heavy locking pressure is necessary. Available in heavy, medium, light duty, for use in military and commercial containers and demountable construction.

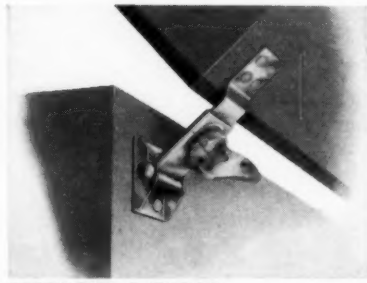


DUAL-LOCK–Impact and vibration-proof high-load butt-joint fastener that will not accidentally unlock or loosen. Recess in panels or surface mount. Withstands 7000-lb. tension.

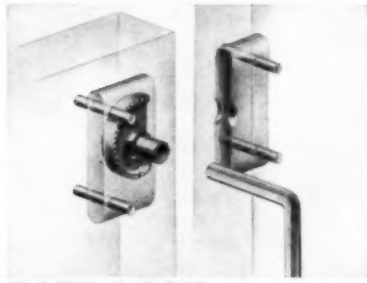


QUICK-LOCK–For assembling removable panels and access doors. Locked by a 90° turn. Various sizes and types, for weather-tight electrical units, cowlings, access panels.

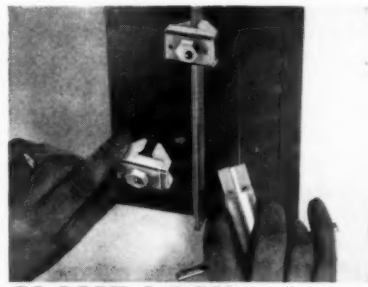




HINGE-LOCK–A rugged pressure hinge which provides a strong seal along the hinge line of gasketed equipment containers and transit cases. Matched hardware with LINK-LOCK.



ROTO-LOCK–Versatile fastener for butt or right-angle joints in portable shelters, partitions, knock-down shipping boxes, etc. Solidly built, springless.



CLAMP-LOCK–A simple and strong, positive-locking clamp for fast assembly (and disassembly) of permanent or temporary rooms and buildings of flanged-panel construction.

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an MPM special report

THE STRAN-STEEL STORY

new line of steel buildings built in one million-square-foot plant

IT IS PROBABLE that few people outside the immediate confines of the building industry are aware of the engineering, manufacturing and styling advances that have been made during recent years to move the pre-engineered steel building from the farm and remote industrial locations to acceptance for a wide variety of commercial and industrial structures. Stran-Steel Corp., a division of National Steel, devotes one million square feet of floor space at Terre Haute, Ind., to the engineering and building of a complete new line of pre-engineered steel buildings to serve what Stran-Steel management believes to be one of the most dynamic growth areas in the building industry — and one of the most promising markets for consumption of the nation's expanding steel production capacity.

An illuminating study in contrast is represented by a comparison of the modern, pre-engineered steel building designed for the 60's and the familiar "Quonset Hut," hundreds of thousands of which were produced during and immediately following World War II for use throughout the world.

Following World War II, the Quonset Hut found a market for many civilian applications such as emergency housing, farm buildings, used car sales shelters, fruit stands, and gasoline service stations. Then, like many other American products that have not been re-engineered to meet current needs, the bottom dropped out of the market for this type of structure.

Thus, as recently as four years ago, Stran-Steel was attempting to operate a profitable business on outmoded, obso-

Typical front of Harley Earl design that is suited to the standardized steel structures by Stran-Steel.

Aerial view of the Stran-Steel plant at Terre Haute, Ind.

(Right)
Charles Homer,
President,
Stran-Steel Div.,
National Steel Corp.

(Below)
M. M. Anderson,
Vice President,
Engineering

(Below, right)
H. G. Knecht,
Vice President,
Manufacturing

MPM PHOTOS

lete products — and without the benefit of product development and product research activity.

"Until we finally decided to get into the business for keeps," recalls Charles Homer, Stran-Steel president, "there was no doubt but what Stran-Steel was easily one of the most neglected industrial step-children in the country. One of the main factors contributing to this neglect, of course, was that direct relationship to the end-product user was still foreign to steel industry marketing tradition."

The decision which put Stran-Steel into the business of mass producing metal buildings "for keeps" involved the following: multi-million dollar investment in new plant and production equipment; substantial expansion of the Stran-Steel engineering staff (activation of a program for designing a broad new line of steel buildings); creation of a product research and development department; creation of a product planning department; creation of a marketing research department; acquisition and installation of electronic equipment for production and materials flow control; and purchase and installation of modern testing equipment.

Engineering organization

Today Stran-Steel has more than tripled the number of people in its engineering department, which is separated into five different departments under the direction of M. M. Anderson, vice president of engineering.

A research and development group is primarily involved in the development of new buildings, new products and testing. A second group is concerned with the design and development of architectural products such as studs, joists, curtainwall materials, etc. A third group is involved in the design and development of transportation products (railroad car flooring, etc.). A fourth group is termed "engineering services," to serve where there are departures from standard buildings; and a fifth and largest group in the engineering department is charged with the responsibility of developing new buildings and improving the standard line.

Standardization

The company now has a line of standard buildings totaling 350. According to Anderson, a primary concern in designing this line of buildings was standardization and interchangeability of parts. In an older line of about eight buildings, there were more than 130 different major parts. In the new line of buildings (350) there are only 65 major parts. For example, a single column in this new line of buildings is used in 16 different units.

An important consideration in connection with the re-engineering of Stran-Steel standard structures was building codes. The company states that a dealer handling these structures now has the assurance that they will meet the building codes within his community.

Distributing organization

While engineering the new buildings and equipping the plant to meet the manufacturing requirements, the merchandising organization was being perfected. First of all, there are more than 200 franchised building dealers who sell either complete buildings or component parts for buildings. This franchise is patterned after an automobile agency franchise.

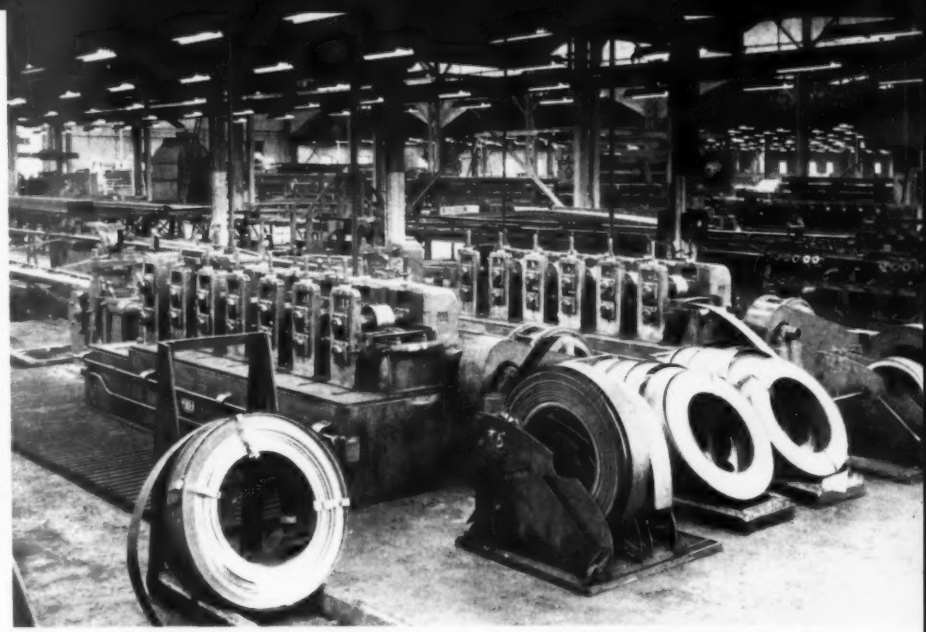
Continued on Page 55 ——→

Modern W. T. Grant store illustrates typical application of Stran-Steel coated steel architectural panels.

AS MIGHT BE EXPECTED, the Stran-Steel fabricating department gets the lion's share of the space in the one million square foot building devoted to the production of steel building units. Because of the size and weight of the building components (particularly structurals), space requirements for material storage, handling, fabricating equipment and product storage are great. (Steel structurals are stored outside.)

Major fabricating equipment includes a full complement of shearing units, the largest of which will shear a 26-foot length of 3/8-inch plate for structurals. Handling of the plate at this point and many other points in the plant is by vacuum lift and roller conveyor.

There are 19 different pieces of roll forming equipment in the plant. Their application varies from fabricating plate for structurals to rolling 18-26 gauge sheets for color coating.



Two of 19 units of roll forming equipment which are used in the Stran-Steel plant to roll steel in gauges from 18-26 gauge coil stock.

FABRICATING STEEL COMPONENTS

There are approximately 25 different pieces of welding equipment, varying from 100 kva spot welders to 50-foot automatic submerged-arc welders.

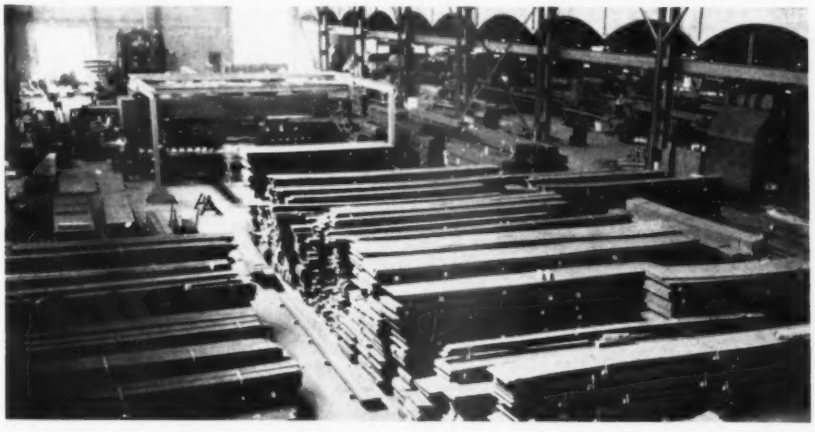
Welding is required for joists, studs, columns and rafters, angles, brackets, clips and decorative building parts.

H-beam arc welding

One interesting setup employing submerged-arc welding is used for the production of H-beams. One plate is placed flat in the jig section of the welder, and two plates are positioned on opposite edges. All pieces are handled by vacuum lifts. The two side plates are held against opposite edges of the web plate by compressed air pressure fingers. These are actuated by the expansion of fire hose under air pressure. Continuous and automatic equipment running on tracks which parallel the sections to be welded complete the submerged-arc welding. A generous supply of flux is fed at the point of welding, and a vacuum tube picks up the excess flux immediately following the welding electrode.

All purlins and girts are punched with Hydro Pierce units. These units have combination die setups, so that punches operate simultaneously in a vertical position and a second set of punches operates simultaneously from a horizontal position. All of the heads hit at one time so that all holes in a single plane are punched simultaneously. Stran-Steel engineers stress that this gives them uniformity of holes and, particularly, uniform relation between holes, piece after piece. Prior to the use of this system, it was found that in piercing holes in the flat and then forming afterward, the camber could throw holes off. They point out there is also the possibility of bumping against the stop. In piercing in this manner, with the simultaneous hits, if there is a variation at the stop, there is a 1/4-inch tolerance, and the holes are still in proper relation to each other.

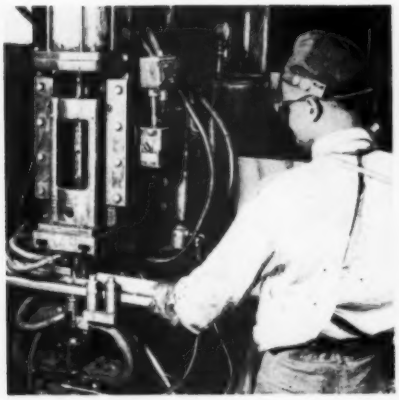
Section of storage department for raw steel plate for the production of columns and rafters. In the background is a large shear capable of shearing 3/8-inch plate, 26 feet long. In the extreme background is a 750-ton mechanical punch press for punching the holes in webs and flanges of columns and rafters.



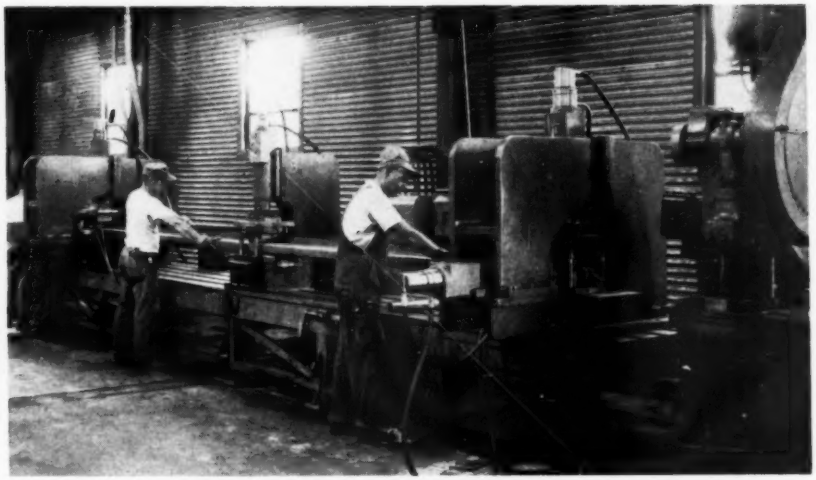
All parts numbered

There are only 65 different *major* parts required for the 350 standard buildings (30 or 40 major parts would complete the average building), but when all small parts, including attachments, are taken into consideration, the total reaches approximaely 135 different parts in the average building. Each of these has a part number and, wherever it is practical, the part number is stamped into the steel in the press that fabricates it. Where this is not practical, the number is stencilled on so that in every case, each indivdual component has the number to carry through fabrication and installation.

All these standard parts are stocked in sufficient quantities so that shipments are made directly from stock. As might be expected, some installations require as few as one to five pieces of a particular structural. This obviously rules out standard production techniques, so press brakes using templets and whistler



A typical spot welding operation on 3⅝-inch studs.



This Hydro Pierce equipment is used for punching as many as seven sets of holes simultaneously in "Z" purlins and girts. Holes for all high production structurals are punched after forming to minimize installation difficulties.

punches are set up for such short runs. These parts are delivered later to the 26-foot press brake for forming. There is also a variety of die sets available in which the pattern or punches can be altered.

100 percent inspection

All columns and rafters get 100 percent inspection of angle, punched holes and welds. Therefore any part in the field requiring a mate or substitute part can be replaced without further checking.

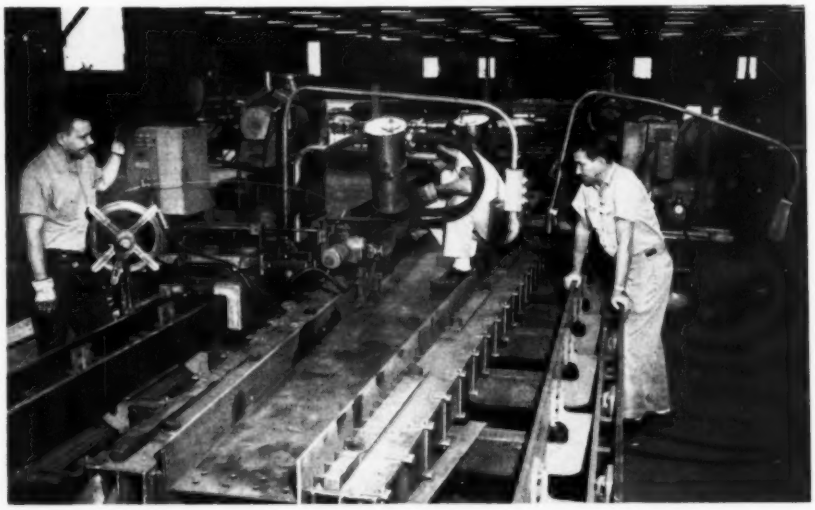
The large structurals get a spray coat of oxide primer on a traveling conveyor, and the primer is fed through a spray heater. Following this hot spray system of application, each structural goes through a gas-fired, indirect heated oven, and from there to the outside storage area.

Stran-Steel buys all of its steel from the mills in 10-ton coils. This coil stock is then slit to sizes that will be roll formed or shaped into standard parts. Before the slitting equipment was installed, the company required 119 different coil sizes. The total number of sizes now purchased is only 20.

There are three separate slitting lines for 48, 24 and 12-inch coils. This section of the plant also includes a roller leveler for use as required.

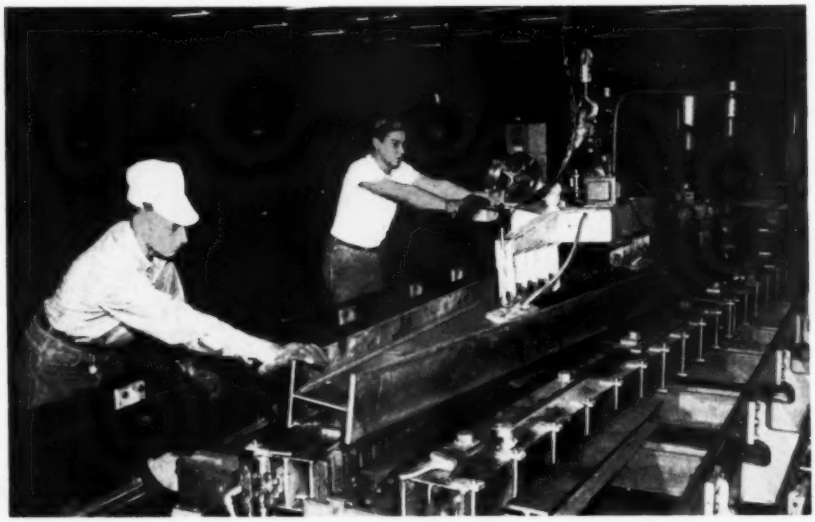
Radio-operated trucks

Radio controlled lift trucks are used throughout the plant to expedite orders and to facilitate movement of the parts throughout the plant and shipping yard. The dispatching area is located in the shipping room. Because of the size and weight of many of the building components, straddle trucks are used extensively. These trucks are equipped with remote control for exit doors, so that the trucks can enter and leave the plant without assistance.



(Above) — An automatic submerged-arc welder of special design used for the welding of main columns and rafters.

Vacuum lifts being used to unload a welded section from welding equipment.



ACCORDING TO HILLERY G. KNECHT, vice president of manufacturing at Stran-Steel's Terre Haute, Indiana plant, the color idea had been in the minds of the Stran-Steel group for several years, during the time of the transition from the old "Quonset Hut" to new, modern structures for use in industry and commerce. Finally, about two and a half years ago, it was decided to put in a pilot plant on a test basis. The experimental line was installed and finished buildings in color were being erected within six months. It developed that 90 percent of the new orders were for color.

At first the use of color was primarily for aesthetic value, and there was little thought of additional protection for the galvanized metal. The coated panels were sold at approximately two cents a square foot over the price of the plain galvanized steel. (Company executives estimate the cost of good painted-in-the-field panels at 10-12 cents per square foot.) Since this early development work, the finish has been refined to become an important part of the protection for the metal, in addition to improving appearance.

Stran-Steel feels that factory-applied colors have been the most important factor in ridding the steel building of its traditional "tin shed" image in the "vast $40 billion-a-year" building construction industry.

Field study

A personal in-the-field canvass was made of a group of dealers to determine what colors were most desirable. The result was the selection of five basic colors and standard white. Currently there are nine standard finishes. They are: white, two blues, two grays, two greens, orange and yellow.

When Charles Homer came to Stran-Steel as president, he opened the doors for executives at the plant to carry through their dream of color on steel buildings on a high production basis. He launched a program of plant modernization and new equipment which included a 600-foot long production line for a new rib designed exterior panel and a complete new finishing installation for flashings and windows.

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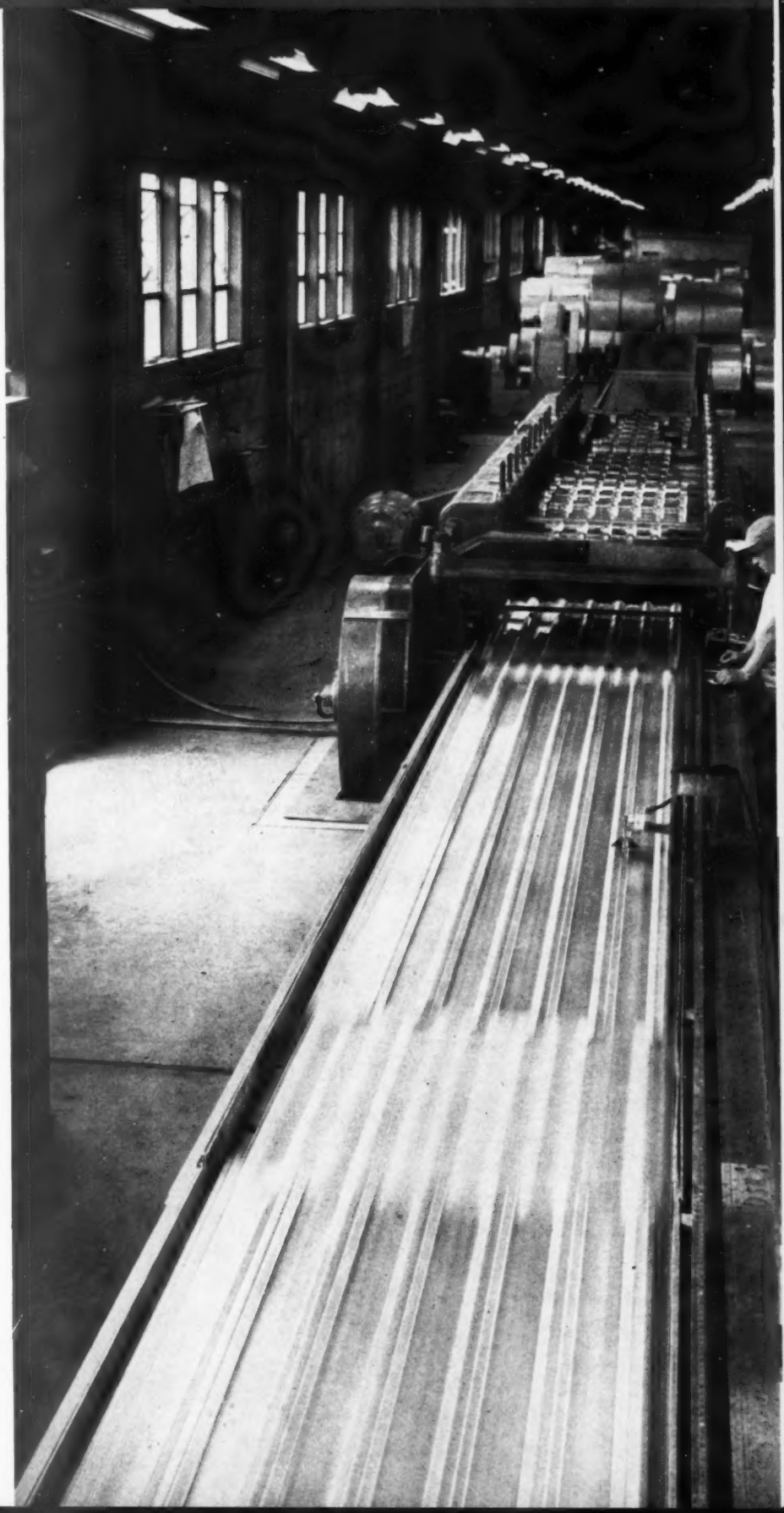
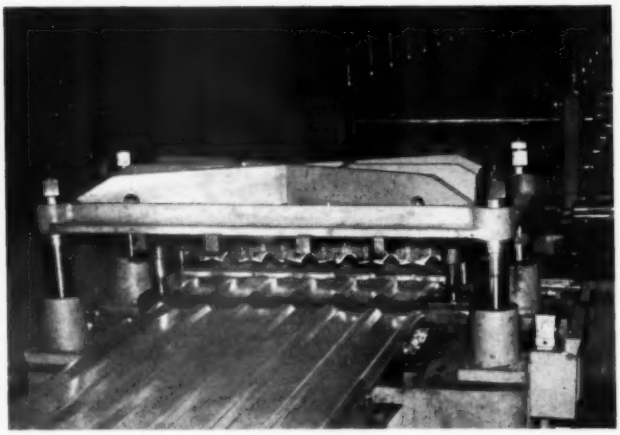
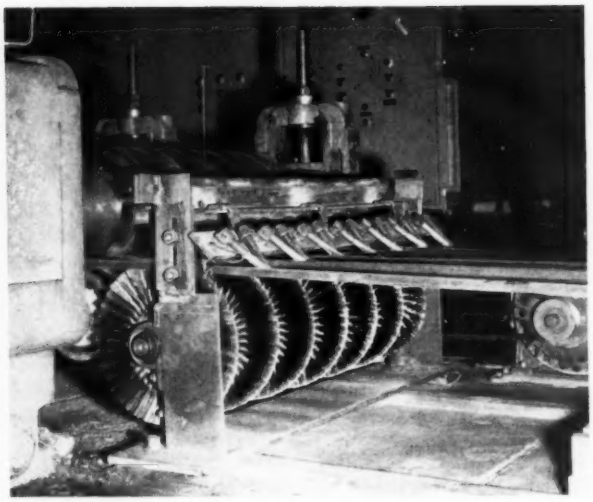


Ribbed, galvanized sheets flow from roll former equipment which is fed from 10-ton coil. This immediately precedes the bond-coating equipment.

NINE STANDARD FACTORY-APPLIED COLORS



Closeup of slug-type die for cutoff on the rigged sheet line. One-half inch of steel is removed, and a clean leading and trailing edge remains. Micro-trip signal adjusts shear to cut to any desired length.



This closeup shows the method of wire brush cleaning the fabricated sheets as they leave the roll former. The straight brushes above clean outside radii, while revolving brushes below clean the concave side.

600-foot finishing line

To be exact in describing the 600-foot finishing line for ribbed panels, it should be explained that this includes the complete operation from 10-ton steel coil to unloading at the end of the color coating line. Actually, there is a transfer point between the combined roll forming and bond coating line, comprising 240 feet, and the color coating line totaling 360 feet.

Fabrication-bond coat line

The 240-foot line starts with a 10-ton coil of galvanized steel of minimum spangle structure, which is loaded on an uncoiler at the head end of the roll forming equipment. A pay-off reel, roll forming, cutoff, run-out, bond coating, drying, and a run-off conveyor complete the 240 feet. Sheets are cut to standard lengths ranging from four feet to 35 feet. The width following fabrication is 38 inches, affording a three-foot-wide net sheet coverage when installed.

The panel emerging from the combination infra-red and gas convection heated oven was bond-coated in the booth visible in the background. The panels are transferred at this point to head of the color-coating line.

Workmen load bond-coated panels onto the motorized roller conveyor which feeds the lead end of the color-coating line. At this point, the panels are entering a preheater to bring them to uniform temperature before coating.

As the galvanized sheet leaves the roll forming equipment, it is subjected to a wire brush "cleaning" to dispose of all possible zinc flaking that may be developed during roll forming. This unit is comprised of a series of straight wire brushes mounted above the sheet and impinging on the radii of the formed ribs. A series of power-driven steel brushes, mounted in direct contact with the lower forming rolls, prevent the buildup of zinc flaking on these rolls. A slug-type flying shear is employed at the

end of the rolling equipment to get a clean leading and trailing edge.

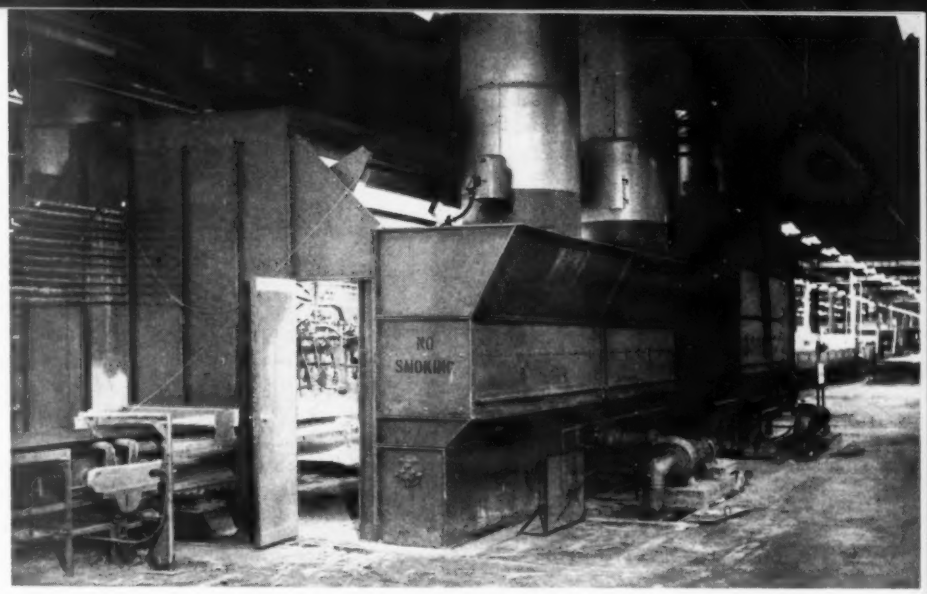
Bond coat application

An extension or run-out conveyor from the roll forming equipment transfers the sheets automatically to a pin-type conveyor which carries them through the bond coat booth. This is a standard conveyorized spray booth, and the bond coat is sprayed with stationary guns. Five guns are required for the complete width of the sheet.

At the exit end of this booth is a short enclosure equipped with a fan to arrest the fumes from the sheet and exhaust them back into the booth.

The panels then enter a 20-foot oven for bond coat curing. This oven has one heat source: an indirect-gas-fired heater. The heater not only supplies the heat, but serves to carry away fumes emanating from the bond coat. There is a section of run-off conveyor following the oven, from which the panels are transferred to the 360-foot color line.

The bond coated sheets are transferred to a motorized roller conveyor which feeds the color coating line. The panels first travel through a 12-foot preheat oven. This is a quartz tube radiant oven (to develop uniform temperature in the panels to be coated, regardless of the season or varying plant temperature). The temperature of the oven is 100-120°F.



Two spray booths on color-coating line apply three separate coats — two in first booth and final coat in second booth, which houses rotary equipment. Balance of line is in background.

Quick color change

In the first spray booth, the ware passes under two sets of stationary spray guns (seven guns per set) for the application of the first two finish coats. There are actually 14 guns at each of these locations, for while seven guns are in use to apply each coat (a total of 14), there are seven guns at each location being cleaned and made ready for a change in color.

The 14 guns at each location are mounted on two horizontal arms which turn on a shaft, so that colors are changed simply by moving the arm into position with clean guns for a new color. This automatically swings the seven guns that have been in production free of the line for cleaning. Average color changeover time is only three minutes.

After only three feet of open space between booths, the ware enters a 16-foot booth housing a rotary spray unit.

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Closeup of one of two dual sets of guns mounted in the first color-coat spray booth. Operator demonstrates the ease of shifting a set of seven guns out of spraying position; the alternate arm has seven clean guns mounted in position for quick color change on the production line.

High speed rotary spray unit, which applies last of three finish coats, has eight guns.

This comparatively high-speed rotary spray unit mounts eight guns and does a remarkable job of covering all edges of the configurated sheet evenly, a result that was found to be a practical impossibility with stationary guns. Checks on the finished product show that the 1¼ mil thickness on flat surfaces is also matched on flanges and radii. An "electronic brain," mounted outside the booth, controls the operation of the spray guns by determining the length of the sheet as it enters the booth.

At the exit end of this booth is another short fume arrestor, and the ware then enters a unique multi-zone oven installation.

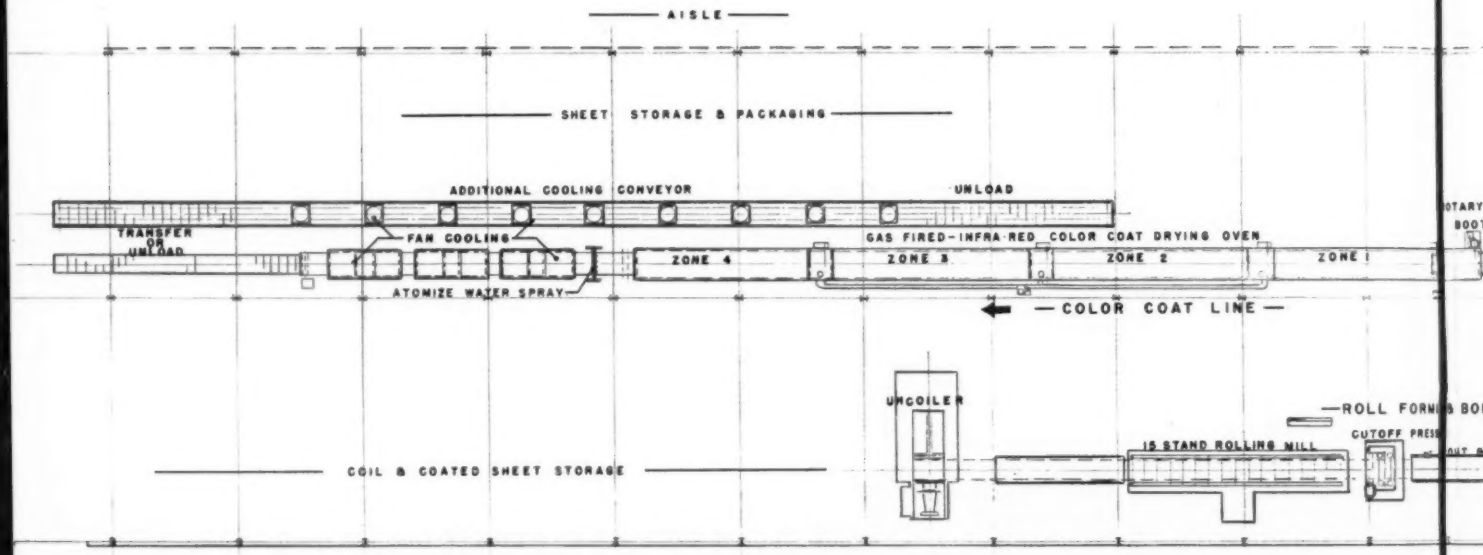
Four-zone oven

This 140-foot long oven has four zones. Each zone has a combination of quartz infra-red tube banks and an indirect gas heat source. The individual zones include: Zone 1 — A 600,000 Btu gas burner with an air movement of 3,500 cfm plus three banks of infra-red tubes with individual ratings of 36 kw (2000 watts), and Zones 2, 3 and 4 — A 300,000 Btu gas burner with two banks of infra-red tubes in each zone.

In the first zone of the oven, the temperature is carried at 275° F., reduced to 175° F. in the second zone, and increased to 250° F in the third.

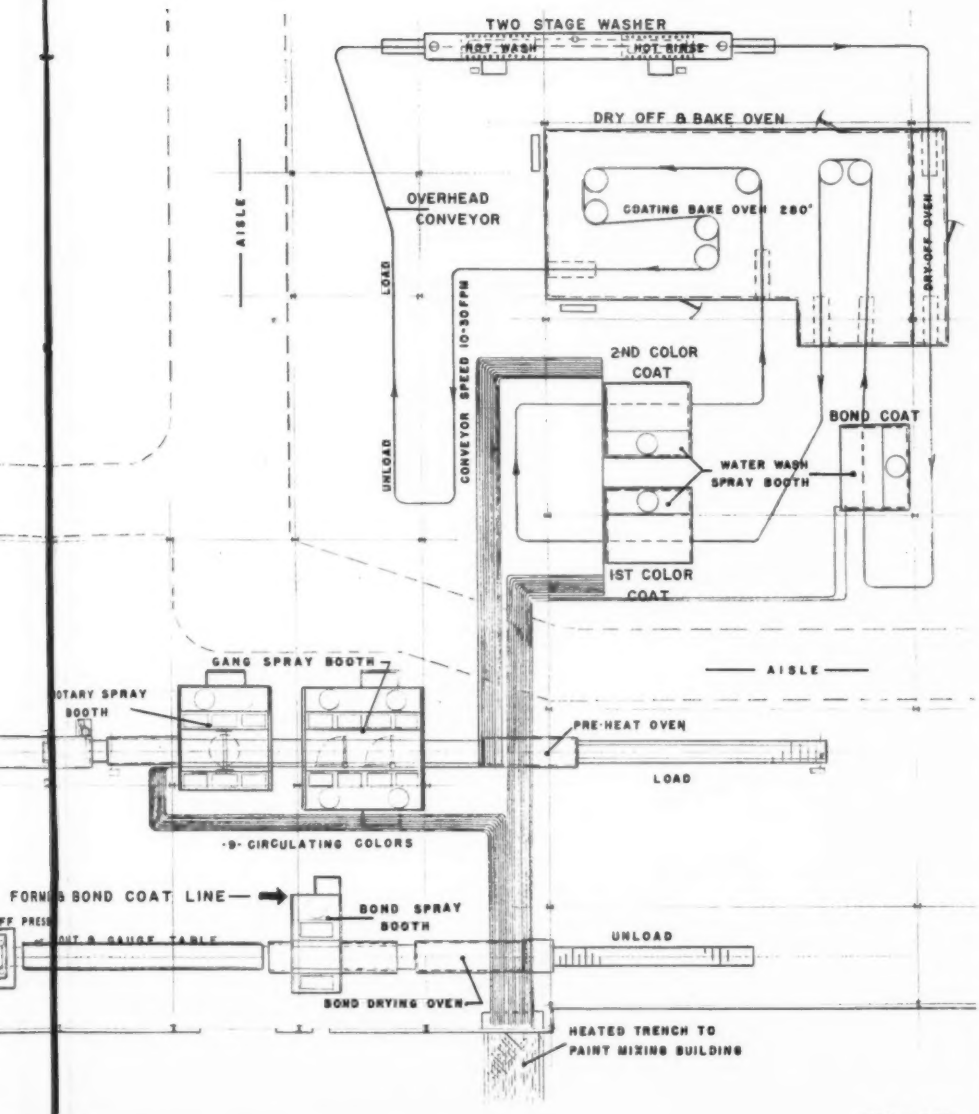
The 275° F. temperature in the first zone is related to the wetness of the

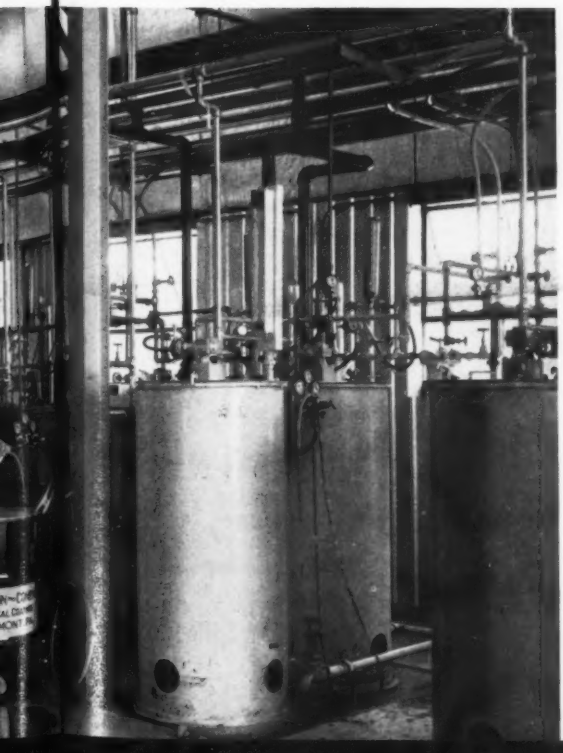
FLOW DIAGRAM OF STRAN-STEEL FINISHING



(Left) — Control board for the color-coating line. It stands adjacent to the lead end of the multi-zone oven, and completely controls temperatures of the four-zone drying and curing oven system, exhaust equipment and water wash booth pumps, conveyor start-and-stop action, exhausting of drying ovens, purging of ovens and lighting of gas-fired burners.

(Right) — This section of the storage and mixing room shows the mixing tanks with high pressure pumps in the background.





coating on the sheet. After leaving the first zone the coating on the sheet is much drier, and beginning to assume a film state. Because of the near-film state, the material must be dried from the bottom out. It has been determined that temperatures in zone two must be held below 200° F. to prevent blistering of the coating. In zones three and four the temperatures are again raised to approximately 250° F. and 300° F. respectively because the drying from the bottom out has been accomplished in zone two.

As the ware leaves the fourth zone of the oven, it is subjected to a water quench from four atomizing guns. The fine atomized water spray is flashed off rapidly by the heat of the sheet leaving the oven, which at that point is 300° F.

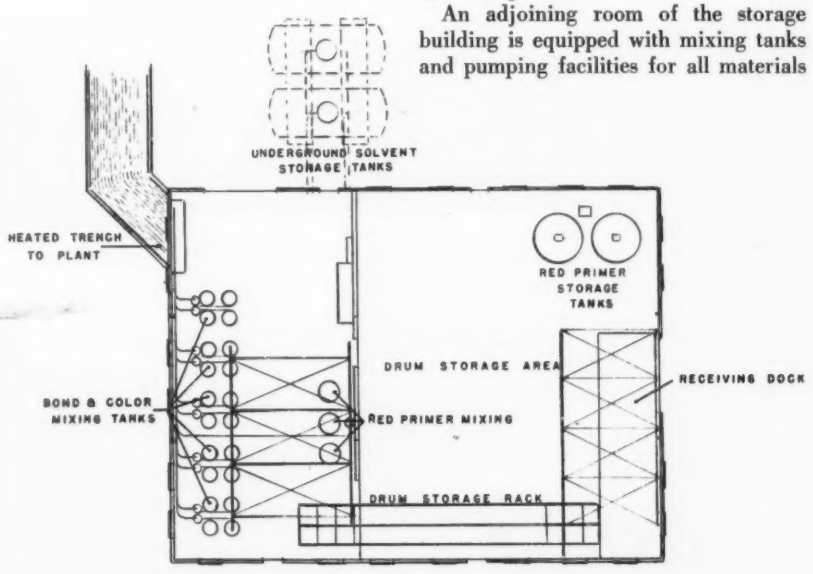
After passing through the ten-foot water quench, the ware proceeds to a 50-foot cooling section equipped with six 36-inch fans which produce 12,000 cfm each at slow rpm.

From here the finished panels are transferred to a gravity conveyor where they are unloaded for packaging.

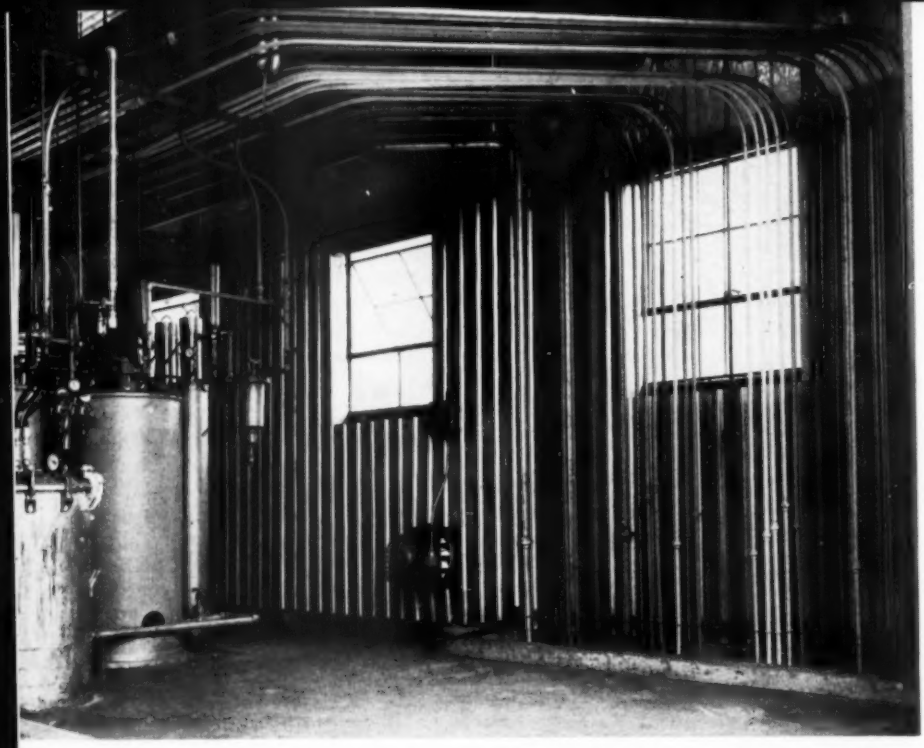
Remote storage and mixing

All coating materials, including the red prime coating for structurals, the bond coat, and color coats for fabricated sheets, are stored and mixed in a building separate from the main factory. Red primer is purchased in tankers and stored in two 3500-gallon tanks. In the same section of the building is storage space for a large quantity of 50-gallon drums in which the other coatings are purchased. Solvent is stored underground.

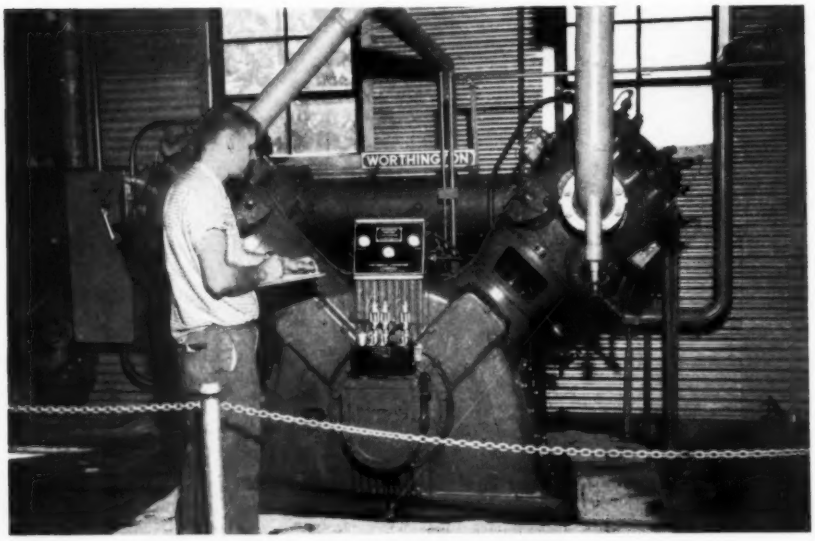
An adjoining room of the storage building is equipped with mixing tanks and pumping facilities for all materials



PAINT MIXING & STORAGE BUILDING



Elaborate piping system for carrying nine standard colors, primers, air, thinners, and red oxide to points of application. Lines are filled and under pressure during operating hours. Tunnel carries piping system from floor line in this mixing room to factory.



This 400 cfm compressor was installed for the sole purpose of serving the coating lines to assure uniform pressure throughout the coating supply system.

Entrance end of a red oxide coating line for structurals. They are dipped at the entrance point of this large oven and are transported by a bar and chain-type conveyor.

used. All coatings are delivered to the point of use through a circulating piping system.

The red primer is transferred from the large storage tanks to three 250-gallon mixing tanks in the mixing room where, after proper mixing with solvent and check for viscosity, it is circulated in the plant through 4,000 lineal feet of 1¼-inch piping. This circulating system serves five dipping operations, including the finish for structurals, small parts dipping, and the rigid frame spray line.

Nine colors plus

All of the standard Stran-Satin coatings (nine in number) are available at all times in the circulating system. Facilities are also provided for a separate single service for special colors, if required. There is also a circulating system for bond coat. This means, including the piping system for red primer, that a total of 11,700 feet of circulating lines is used in the complete system.

There is a screen-type filter at the exit end of each tank, and these are manually cleaned every 20 minutes. The white is mixed to approximately 30 on a Zahn No. 2 cup, while colored materials run from 20-24 seconds on the same test. This material, after being mixed to proper viscosity, is piped through high pressure pumps at an approximate pressure of 100-pounds per square inch in the line. The lines feed from the paint mixing room through an underground trench into the production department, and this, in the winter uses special heating to keep it above 70° F.

Separate compressor

Due to the heavy requirement for compressed air in the Stran-Steel plant, it was found early in the operation of the color coating line that fluctuations in air pressure could be quite disastrous on the finishing line. As a result, a 400 cfm air compressor was installed adjacent to the main finishing line. This unit is used for the sole purpose of serving the finishing system. This has resulted in easy maintenance of specified pressures. As an additional check, however, there are indicating gauges at the booths, and a check on the pressure of each line is made four times daily.

Throughout the working day, all materials in the lines are kept up to

pressure. During the night or a weekend when the plant is not operating, the compressor is shut down (all pumps are air-operated) and the material is left in the lines.

The materials would not, however, be left in the lines in excess of three days. In the event of a shutdown for a greater length of time, all colors would be handled into 120-gallon mixing tanks to allow for pumping solvents from a second tank into the lines. (In the red primer line, for example, it would take 250 gallons of solvent to purge and fill the line.)

Type of coatings used

For the fabricated ribbed sheets, the first coat or bond coat consists of a combination metal treatment and primer which simultaneously phosphates the metal and deposits a corrosion inhibitive primer-type continuous film. The coating is based on a high molecular weight, vinyl acetal resin, combined with active compounds of phosphoric acid, chromates, and alcohols. This first coat is applied to yield a dry film thickness of 0.25 mil.

Finish coats are vinyl type, based on resin of the vinyl chloride, acetate copolymer type. White, yellow and orange have non-metallic pigmentation. Other standard colors have metallized pigmentation.

An interesting feature in the mixing room is that the tanks for the individual colors, plus the individual pipes in the system within the mixing room, are all painted with the same color as the coatings serviced by the tank and piping.

FINISHING FLASHINGS AND WINDOWS

THE MAIN FINISHING LINE for the color coating of the fabricated, ribbed, galvanized panels is set up for high speed, straight line production (*80 feet per minute*) and therefore is not suitable for the finishing of miscellaneous parts such as required for flashing or for the specially designed windows for the metal buildings.

A completely new line is currently being installed for this purpose. The new finishing system is built around 700 lineal feet of monorail-type conveyor, with an elevation for loading and unloading of approximately six feet, ten inches.

Magnetic hanging tools

Metal parts are loaded on magnetic hanging tools having a 40-pound pull. These can be used for all shapes and sizes, eliminating the necessity for hanging holes in the parts and the great variety of hooks that would be required for the many types of pieces to be run. Obviously the use of this type of magnetic tool results from the fact that the parts are finished on one side only.

After the parts are loaded on the magnetic hooks, the conveyor proceeds to a 50-foot two-stage washer. The first ten-foot section, which is preceded by a seven-foot enclosure, is a spray cleaner unit with pressure nozzles on one-foot centers operating at 30 pounds spray pressure on both sides of the ware. Bath temperature for the cleaner is 160° F. The tank is heated with a one million Btu burner.

A 16-foot drain board allows the cleaner solution to drain back to the tank, and the ware then proceeds to a ten-foot section of hot rinse at 140° F. to 160° F. This temperature is considered necessary not only for the proper rinsing of the material, but to promote drying after the ware leaves the washer. The first drying following cleaning is two minutes at 280° F. Seven-foot enclosures preceding and following the washer contain exhaust fans.

Multi-purpose oven

As the material leaves the washing unit, it travels to a large multi-purpose drying oven. This single drying unit provides for drying following cleaning, as well as for baking the bond coating and the color coating. The oven is equipped with blow-back tunnels to trap the oven heat.

After leaving the drying oven, flashings go to the bond coat booth where the coating is applied by hand spray. As in the case of the main coating line, all coating materials used in this new system are delivered in the circulating system from the paint mixing building.

As the parts leave the 14-foot water-wash spray booth, they return to the oven for a four-minute baking period. The material then comes out again at 280° F. In order to maintain this temperature throughout the large oven, a two million Btu burner (mounted above oven) is used.

From the oven, the parts proceed to the second 14-foot booth for the hand-

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The Stran-Steel story

→ *from Page 46*

Second, there is a separate group of 50 "architectural" dealers who handle Stran-Steel's architectural products such as channels, C-sections, joists, studs, roof decking, curtainwalls, and colored panels.

The complete information on these products is cataloged, priced and simplified so that a dealer can quickly price any section or component of a building for the prospective buyer. Should the requirements for a building be beyond the capacity of a local dealer to adapt the standard architectural parts to the building design, the problem can be sent to the company's customer service department for engineering advice on drawings and specifications.

Consumer research and design

Before engineering its new line of 350 steel buildings, Stran-Steel retained Harley Earl, retired vice president in charge of styling for General Motors. Earl, credited with styling more than 40 million automobiles, played an important part in consumer research and design.

For the complete new line of 350 buildings, Harley Earl selected an assortment of nine attractive colors, and counseled on the design of distinctive looking fronts, and a new window design for standard buildings.

Some idea of the complete evolution in Stran-Steel buildings is brought out in a statement by Hillery G. Knecht, vice president of manufacturing, in which he reports that "Stran-Steel's manufacturing operators today do not produce any building part or component which was in production by the company only three years ago."

The market for steel buildings

While Stran-Steel puts few limitations on possibilities for the future market for steel buildings and currently has plans for supplying buildings to the school market, the following are listed as primary targets for their current merchandising program: (1) bowling alleys, (2) supermarkets, and (3) automobile dealerships. At the same time the company plans to hold its business in the markets which have been of prime importance in the past — the farm market, and industrial and commercial buildings — and for good reason, for it is estimated that farmers will spend $1 billion on building construction this year, and the industrial, commercial and institutional building market is rated at $14.6 billion by trade statisticians.

Workmen unloading finished panels from color line conveyor. Panels are immediately stacked and packaged near this point.

spray application of the first color coating. This is followed by a flashoff period of approximately three minutes. Then comes a third booth for the second and final application of color coat. Hand spray is used throughout this section of the plant because of the wide variety of part shapes and sizes.

Following final color coating, the parts return to the baking oven for a ten-minute bake — again at 280° F.

Variable chain speeds

The conveyor speed may vary from ten to 30 feet per minute. Speed is usually determined by the cleaning requirements for the parts being run. For example, when cleaning windows, which require drawing compounds, greater time is allowed in the two-stage washer. It was decided to vary chain speeds in cleaning rather than provide longer washer equipment. When handling some materials that are factory-stored and not severely soiled, the line can be speeded up to 30 feet per minute. This still allows sufficient oven drying time to set the applied coatings prior to unloading from the coating conveyor.

This new coating department is designed to be operated with from five to seven men — one man at each spray booth and from two to four for loading and unloading, depending upon the parts being run. MPM

COATING PERFORMANCE TESTS

Stran-Steel's system includes nine standards. White, yellow and orange have non-metallic pigmentation. The other standard colors have metallic pigmentation.

The company has a complete set of material and performance specifications for the color coated steel panels. They cover surface preparation, the combined metal treatment and primer, finish coats, and a complete set of tests for the end product.

The combined bond coat and finish coat must yield a dry film thickness of 1.25 to 1.5 mils.

Adhesion is checked by a standard cutting and peel test. Color and appearance are checked both by a color difference meter and visual inspection by qualified color matchers. There is a specific requirement for gloss on the non-metallic colors. Metallic coatings are in satin finish and have no gloss requirement.

A 500-hour salt spray test is used, as well as a two-week immersion test, a 500-hour weatherometer test, and a 500-hour humidity test at elevated temperature (105-110° F.), with a relative humidity of 95-100 percent.

Additional tests cover flexibility and abrasion resistance, as well as outdoor exposure.

Typical performance standards

COATING THICKNESS — must show dry coating film thickness (including pretreatment and finish coats) to be 1.25 to 1.5 mils.

ADHESION — a cutting and peel test must show separation of materials before release of coating-to-metal bond.

COLOR AND APPEARANCE — color standards match by mechanical meter and by trained color matchers.

GLOSS — for non-metallic coatings, average specular gloss standard is 15-20, according to Federal Test Method Standard 141, Method 6101. The metallic coatings have a satin finish (no gloss requirement).

SALT SPRAY — coated panels are tested for resistance to salt spray — 500 hours exposure. No more than 1/8-inch loss of adhesion from score marks.

WATER IMMERSION — tested in accordance with ASTM method, for two-weeks period. After two-hour recovery period, film must show no blistering or loss of adhesion.

STRAN-SATIN COLOR BOOSTS SALES-APPEAL

with THOMPSON CHEMICAL COATINGS

All the beauty of color comes to Stran-Steel buildings through the use of Thompson Coatings. Just as important, corrosion-resistance and wearability come, too.

To provide *extra* sales-appeal and customer satisfaction, Thompson specialists developed a coating system which combines the attraction of color with long-lasting durability.

It's one of many examples of how Thompson is helping manufacturers solve finish problems . . . to make better, more-appealing metal products.

Typical Stran-Steel building, showing how the manufacturer has combined architectural styling with economy and utility.

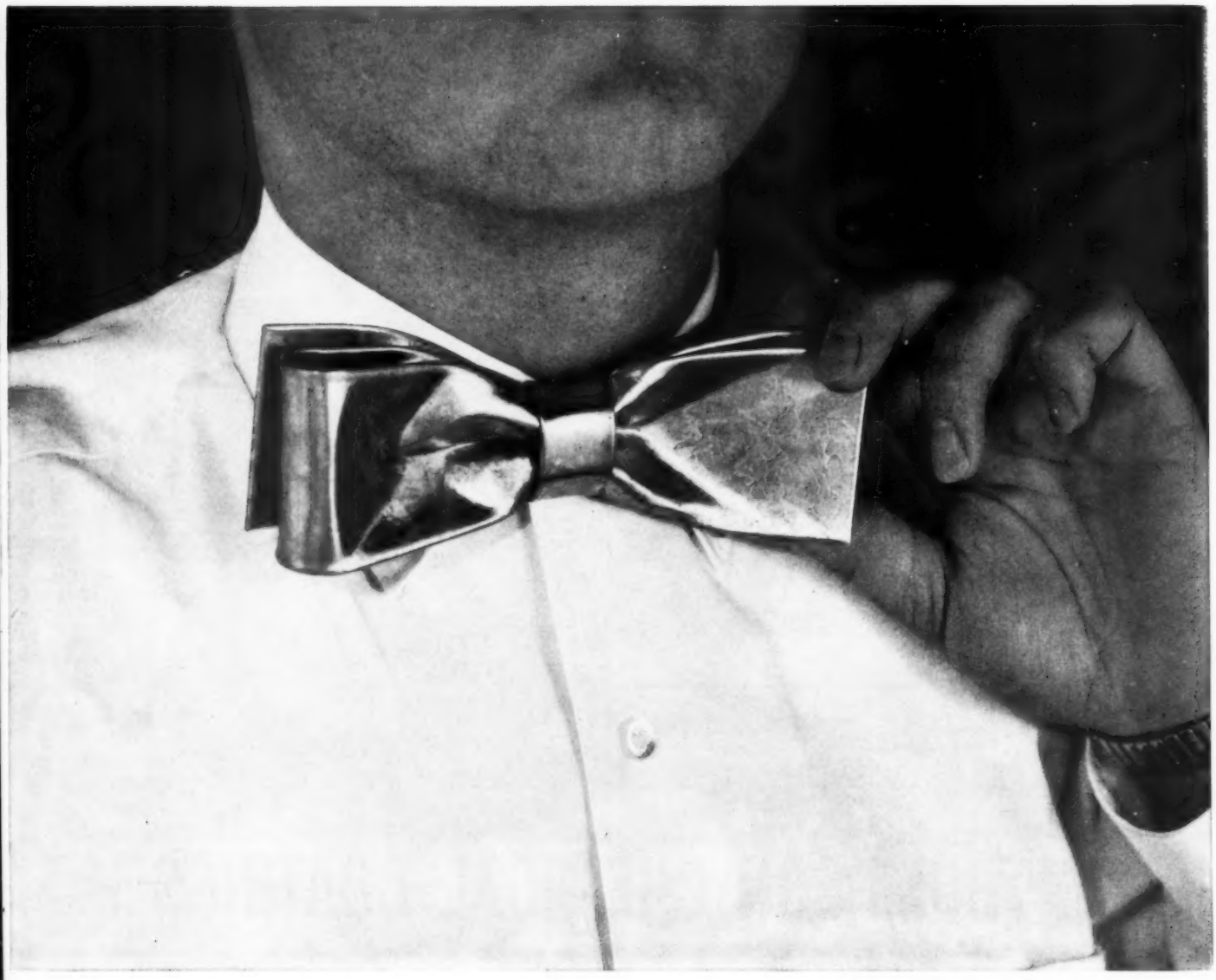
Thompson paint engineers and chemists are at your service, too. From the word "Go!" they'll put their knowledge and their facilities to work for you . . . to help you develop a system that will make your product a better product. Call or write Thompson for a survey and suggestions, without obligation.

THOMPSON AND COMPANY

Manufacturers of Chemical Coatings for 113 Years

Oakmont (Pittsburgh District) Pennsylvania

NATION-WIDE MANUFACTURING AND SERVICE FACILITIES



You can't buy this tie in a haberdashery

Even the finest English clothiers couldn't furnish you a necktie like this one. We're using it to demonstrate how you can form USS Galvanized Steel Sheets. Even when we tied it in a bow, there was no flaking of the zinc coating.

USS Galvanized Sheets don't flake because there's a tight, uniform bond between zinc and steel. Add excellent ductility and you have galvanized sheets that are ideal for severe fabrication. To give your products added quality, always specify USS Galvanized Sheets.

USS is a registered trademark

Steel

This mark tells you that a product is made of Steel

United States Steel Corporation — Pittsburgh
Columbia-Geneva Steel — San Francisco
Tennessee Coal & Iron — Fairfield, Alabama
American Steel & Wire — Cleveland
United States Steel Supply — Steel Service Centers
United States Steel Export Company

United States Steel

USS

MPM

new supplies and equipment

Uni-Point Screws for Aluminum

The need for pre-drilling holes is eliminated by a special line of screws developed for aluminum windows, doors, awnings, carports, and patio columns.

These special screws are available in various head styles; acorn washer heads, indented hex

heads, Phillips and slotted heads. All have an extremely hard needle point. A minimum of pressure is required to drive the screws into the metal.

Known as Uni-Point, the screws are made of bright hardened Type 410 stainless steel, which combines high strength and corrosion resistance under all atmospheric conditions, as well as other metals. The screws are available in various sizes, and no special or expensive tools are required to drill them into aluminum structures.

Write Dept. MPM, Universal Screw Co., 2401 Brummel Place, Evanston, Ill.

Low-Pressure Air Nozzles

A special set of precision made, low-pressure air nozzles to meet special conditions inherent in the spray application of polychromatic

lacquer and acrylic enamel has been introduced. Four nozzle types are offered: 36SE for Model 7 spray guns; 66SG for Model 18, 19 and 29 guns; and 63PH and 63PH-1 for Model 18, 19, 21 and 29 guns.

Write Dept. MPM, Binks Mfg. Co., 3114 Carroll Ave., Chicago, Ill.

Portable Tier-Rack

Two completely interchangeable steel tube frames snap onto your present pallets, converting them to pallet racks, using no special attachments, bolts or screws. When not in use, the frames can be dismantled and stored in minimum space.

Write for Brochure D-6 to Dept. MPM, Tier-Rack Corp., 122 N. 7th St., St. Louis 1, Mo.

Snap-Acting Precision Switch

The split-contact construction of the Type BK-1 enclosed snap-acting precision switch is said to combine versatility in circuit control with high safety factor in heavy current dc circuits. It can be wired as a single-pole double-throw switch with series contacts that break each circuit in two places at once; as a conventional spdt switch with contacts parelleled to give decreased contact resistance; or it can provide spst double-break action in two separate circuits operating alternately.

Write Dept. MPM, Unimax Switch Div., The W. L. Maxson Corp., Ives Rd., Wallingford, Conn.

Ultra-Miniature Indicator Lights

"Data Cap" assemblies offer: a lens cap with a colored cylindrical lens on which a legend may be hot-stamped; and a clear lamp cartridge without a legend. Should the cartridge burn out,

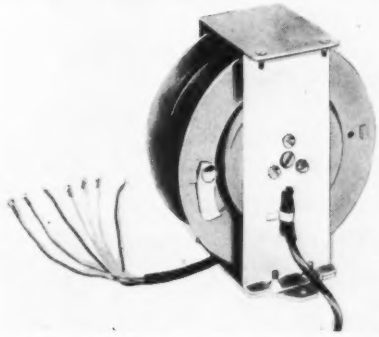
it may be quickly replaced from front of panel.

The indicator lights are useful wherever "read-out" indication is required, notably; data processing equipment, computers, instrumentation, control equipment, automation, etc.

Write for Brochure L-160B to Dept. MPM, Dialight Corp., 60 Stewart Ave., Brooklyn 37, N. Y.

Retractable Cord Reel

A development in retractable cord and reels is said to eliminate all brushes or other friction contacts. Each conductor is continuous from



end to end, and the number of conductors is limited only by the allowable diameter of the cable.

The unit is 4½ by 4¼ by 1¾ inches, and carries a seven conductor cable which is 0.165 inches in diameter. Cables with more or with fewer conductors can be supplied.

Applications include audio, radio, television, and portable appliances such as toasters and vacuum cleaners.

Write Dept. MPM, The Morey Corp., 2014 N. Major Ave., Chicago 39, Ill.

Burnishing Compound

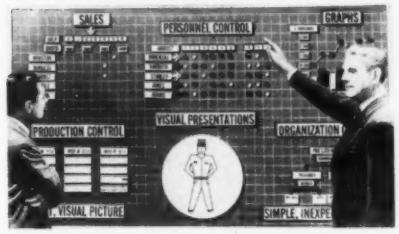
A burnishing compound designed for use on zinc, aluminum, steel and other metals has been introduced. The compound, FM 286, works well on all metals except magnesium, and offers many advantages. It is mildly acidic, and produces brilliant blue-white color on zinc die castings.

Write Dept. MPM, Oakite Products Inc., 117 Rector St., New York 6, N. Y.

Magnetic Control Board

Visual controls for business operations, with instantly changeable magnetic devices visible for all to see and be guided by, have been introduced.

Magnetic control consists of a magnetic steel board which holds firmly on its surface the visual



elements that comprise the needs of the user. It can be used for production schedules, sales records and quotas, management control and analysis, graphs and charts, service schedules, and many others.

Write Dept. MPM, Methods Research Corp., 105 Willow Ave., Staten Island 5, N. Y.

Vibration-Free Cutting Tools

"Ferro Damp," a new line of cutting tools for the metal removal field, has been introduced. Made of copper-infiltrated powdered iron, the tools are expected to have 400 to 500 percent greater life than conventional tools.

Rate of metal removal can be increased substantially, it is claimed, because of higher sfm and greater feed rates. Closer tolerances can also be achieved, and the lack of vibration permits improved finishes, giving maximum metal removal at minimum cost.

Write Dept. MPM, Ferro Powdered Metals Inc., Salem, Ind.

Solenoid Valves

Cooler coils and quieter operation are claimed for a new series of solenoid valves developed for flow control in vending machines, electrical appliances, oil burners, pneumatic instruments

and industrial process controls. Longer mechanical life is made possible by design improvements that have reduced valve noise and coil heat rise. The valves are available in two and three-way types, normally open or normally closed, for ac or dc operation.

Write Dept. MPM, Allied Control Co., Inc., 2 East End Ave., New York 21, N. Y.

Enclosed Gear Motor

A compact enclosed gear motor with the field mounted directly behind the gear housing

STANLEY
SPRING MANUFACTURING COMPANY
FOUR SLIDE
for the little "extras" that count so much

A complete line of specially designed and equipt Four Slide machines to produce the many intricate metal stampings and wire forms requiring more than one simple operation. The attached drawings are illustrations of just a few of the complex metal stampings and forms developed by Stanley Spring Manufacturing Company craftsmen on the Four Slide machines.

Plus . . . the little "extras" brought to you in know-how . . . experience . . . dependability. All products of Stanley Spring Manufacturing Company. All yours in every spring, wire form or stamping we produce for you.

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5050 W. FOSTER AVE.
CHICAGO 30, ILLINOIS

DOC TUFFY TO THE RESCUE
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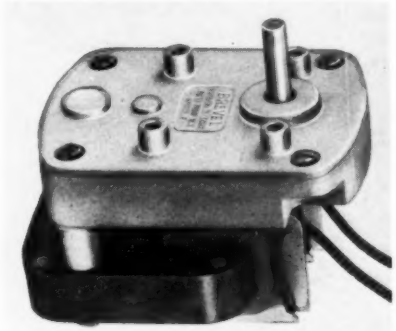
I CAN'T STAND IT, DOC TUFFY EITHER THOSE MUSHROOMED TIPS GOTTA GO... OR I DO!
FOR YOUR CONDITION, I PRESCRIBE REPLACEABLE TUFFCAP TIPS
Mushroomed spotweld tip? Don't throw it away! Toss out the worn end . . . re-use the shank! You can when you use replaceable TUFFCAP TIPS and long-life TUFFALOY SHANKS.
Get the Tuffaloy Catalog and Price List. Write or call your nearest Airco or Tuffaloy office.
TUFFALOY.
AIRCO
AIR REDUCTION SALES COMPANY
A division of Air Reduction Company, Incorporated
150 East 42nd Street, New York 17, N. Y.
Air Reduction Pacific Company • Air Reduction Canada Limited

has recently been introduced. The motor has output speeds from 6 to 120 rpm with output running torques of 12 inch pounds at 6 rpm for continuous duty.

Designed for use in vending machines, business machines, photocopy machines, displays, and as a control device in large equipment



such as conveyors and industrial mixers, its many variations provide a custom-tailored motor with minimum delay. The motor can be geared for a variety of speeds higher and lower than standard, and wound for higher torques at intermittent loads.

Write Dept. MPM, Brevel Products Corp., 639 W. 26th St., New York 1, N. Y.

Paint Spray Process

The Chemtronic paint spray process is said to be an entirely new concept in the paint application field. It differs from all other paint spray

processes in that a hydrocarbon compound known as "Chemsine" is heated and vaporized into a dry gas 2½ times heavier than air and used to atomize and apply the paint.

Write Dept. MPM, John J. Fannon Products Co., Subsidiary of Hupp Corp., 3000 East Woodbridge, Detroit 7, Mich.

Atmosphere Induction Brazing Fixture

A line of production fixtures to braze metal assemblies under a controlled atmosphere by induction heating has been introduced. Reducing atmosphere prevents oxidation on the work during heating, thereby eliminating the need for flux. This type of joint is essential in numerous assemblies to insure dependable corrosion-resistance and strength in critically-stressed inaccessible parts. Combining induction heating, and a controlled atmosphere, these units are said to have proven themselves in joining copper alloys, steel, and stainless steel assemblies on a production basis.

For further information, contact Dept. MPM, Lepel High Frequency Laboratories, Inc., 55th St. and 37th Ave., Woodside, N.Y.

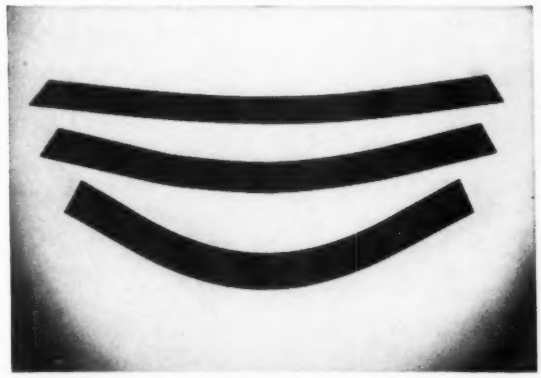
NEW BETHNAMEL SHEETS

for the best porcelain enameling you ever had

Virtually carbon-free, Bethnamel ends boiling, fishscaling problems

Bethnamel is a totally new kind of steel sheet for porcelain enameling developed by Bethlehem research engineers. All production tests show that you can get the best enameling you ever had when you use Bethnamel sheets.

Because Bethnamel has a carbon content of .003 pct or less (barely 1/10 that of ordinary enameling iron), the problems of boiling and fishscaling drop out of the picture. Other chemical elements are properly balanced to maintain superb enameling properties, and provide excellent sag resistance, drawability, and weldability.



SUPERIOR SAG RESISTANCE These three sheet steel samples were subjected to firing temperatures of 1600 degrees F. Your naked eye can discern that Bethnamel (top) held up better than enameling iron (center), and demonstrated a clear superiority over cold-rolled sheet (bottom).

BETHNAMEL HAS SUPERIOR DEEP-DRAWING QUALITIES

This crisper pan for a refrigerator is an especially tough draw because of the relatively sharp corners. Drawing-quality Bethnamel sheet passed the test with flying colors—no splits or cracks to mar the beauty of the porcelain finish.

Excellent for Direct-on Enameling, Too

Bethnamel not only enamels well in the standard two-coat process; it is giving excellent results in direct-on enameling as well. Pretreatment practices for producing excellent adherence and rich appearance of the enamel are simple and inexpensive.

Carries No Premium Price

You might expect to pay more for such a superior sheet, but the fact is that Bethnamel costs no more than conventional enameling iron. If you'd like further details, write for 6-page technical bulletin, Folder 734.

BETHLEHEM STEEL COMPANY
BETHLEHEM, PA.
Export Sales: Bethlehem Steel Export Corporation

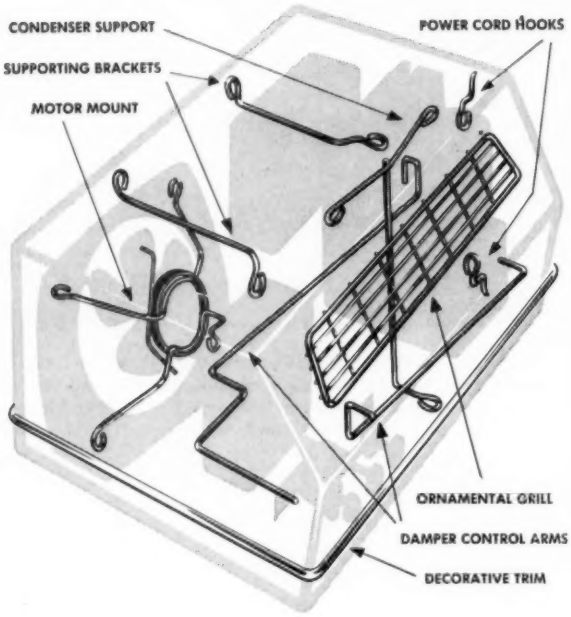
Steel *for Strength . . . Economy . . . Versatility*

BETHLEHEM STEEL

BETHLEHEM STEEL

working wonders with WIRE

Versatile wire components fill 7 functions in air conditioner



Consult Titchener on your design and redesign problems. Wire forms and assemblies are:

ECONOMICAL — save materials, tooling & machining.

STRONG — rugged wire parts and assemblies can be made in sizes up to ⅜" diameter.

LIGHT — reduced weight cuts shipping costs, improves products.

EFFICIENT — absorbs vibration, allows free passage of air, attractive.

WRITE *for free wire design packet. Contains helpful manual on wire construction, case histories, and "Think Wires."*

E. H. Titchener AND COMPANY

66 Clinton Street, Binghamton, New York

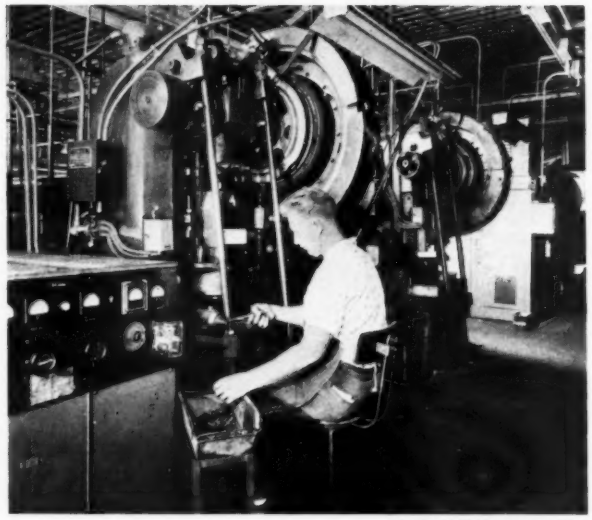


PHOTO COURTESY FAWICK CORP.

Hot heading presses at Voi-Shan with air clutch and brake modernization package in combination with flywheel.

Air clutches boost press output, decrease maintenance

SWITCHING FROM MECHANICAL CLUTCHES to air-actuated units on hot heading punch presses has provided major improvements in machine control, component service life, and operational safety at Voi-Shan Mfg. Co., Culver City, Calif. The firm, a large volume producer of high-precision fasteners for aircraft and missiles, reports a production increase of 20 percent and a decrease in maintenance costs of 80 percent as a result of these improvements.

Systems completely modernized

When Voi-Shan embarked on their press modernization program, they replaced not only the mechanical clutches, but also the brake and control systems. This was accomplished on each of six presses with a standard press modernization package produced by Fawick Airflex Div., Fawick Corp., and known as FSPA (Fawick Standardized Press Application). The package consists of (1) a constricting-type air clutch, (2) a spring-engaged, air-released brake, (3) high speed electro-pneumatic controls, and (4) a new flywheel with anti-friction bearings.

Better control the key

With former power transmission systems, Voi-Shan found that total machine control began to slip as the clutches grew older. This was hazardous to press operators, since cycle timing must be exact. The maintenance costs involved in guarding against accidental re-cycling became excessive.

The new air clutches are automatically self-adjusting for wear, providing instantaneous torque transmission without repeats or slippage. Pushbutton control makes setups easy, exact, and cycle timing is precise.

Elimination of backlash

Another important advantage of the new clutch and brake package is elimination of damaging backlash. Starting and stopping are instantaneous, which has resulted in longer die life and greater machine precision, while substantially reducing tool and die maintenance costs. ——————*MPM*

INTERLOX...

a better, lower cost, easily controlled phosphate coating that LOCKS your finish to the metal.

Interlox's unusual cleaning ability and radically different type of accelerator produce an even, fine grained, dense coating that literally locks an organic finish to the metal.

Interlox gives you the ultimate in appearance, adhesion and corrosion resistance—no streaks, stains, powdery residue or flash rusting to complicate your production. Interlox baths are unusually long lived and require less replenishment and control.

Extra cleaning power is easily obtained at any time by the addition of a low-cost detergent only. This avoids the danger of over-phosphatizing by the costly practice of adding complete phosphatizing compound when only cleaner is needed.

There is an Interlox product to meet your particular requirements, whether spray or immersion type, single or multiple stage.

Licensed Manufacturers { **Alert Supply Co., Los Angeles, California**
Armalite Company, Ltd., Toronto, Canada

NORTHWEST CHEMICAL COMPANY
9310 ROSELAWN **DETROIT 4, MICHIGAN**

HELP SCIENCE FIGHT TB

One out of every five Americans is infected with TB. Chances are that one out of twenty of those infected will break down with active disease during his lifetime. ✝ Your Christmas Seal contribution can help research find a way to prevent those breakdowns — perhaps to save someone you love.

ANSWER YOUR CHRISTMAS SEAL LETTER TODAY

Chicago press makers display latest equipment

Clearing Division

The Clearing Div. of U. S. Industries, Inc. held open house concurrently with the Tool, Machinery & Production Engineering Shows in Chicago, and displayed an impressive array of modern fabricating equipment and tooling.

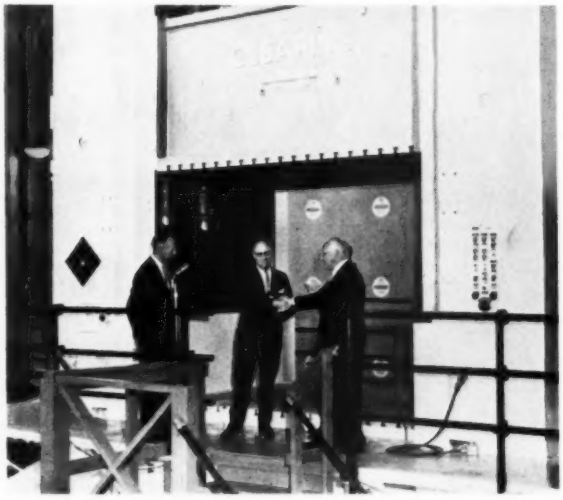
At the start of a trip through the plant, a visitor saw seven Clearing presses ranging from 550-ton to a 1300-ton double action press, all of which are used exclusively for die tryout.

Next was a building erected in 1956 which provides 62,000 sq. ft. of floor space for a weld shop, followed by a series of five large pantograph flame cutting machines capable of cutting to a thickness of 14 inches, plus one small machine for lighter work.

Under construction is a 3000-ton mechanical press scheduled for South America to produce auto body parts. The total weight for shipment will be 1,200,000 pounds. The bed structure alone weighs 212,000 pounds.

Next the visitor saw a lineup of welded steel lathes (Clearing Axelson). These trim machines have been converted from cast iron to welded steel and are set up for numerical control using GE equipment.

Final highlight of the trip was a view of a bottom drive press (800 ton presses), one of four on order which has been designated the 15,000th press to be produced by the company.



John R. Bartizal, president of Clearing, presents a plaque to Ford Motor Co., purchaser of the 15,000th press. Accepting the plaque on behalf of Ford is Frank J. Bushroe (center), plant manager, Chicago Stamping Plant, Metal Stamping Div. Man at left is unidentified.

The press is of bottom drive construction, and has a capacity of exerting 800 tons. Total weight is 325,000 lbs., and it will be installed at the Ford Dearborn plant.

Danly Machine Specialties

A completely automatic high-production coil-fed press and auxiliary equipment was the main feature of the Danly Machine Specialties, Inc. exhibit at the Machine Tool Exposition.

The installation featured a Danly 400-ton Autofeed press, complete with a slide cushion, a skip-type scrap cutter, a grip feed (adjustable while in motion), and a coil-loading car. Among the accessories on the press were a slide positioner, load indicator, and die light.

Also on display was a 100-ton OBI featuring a static press control and eddy current drive control. To highlight its

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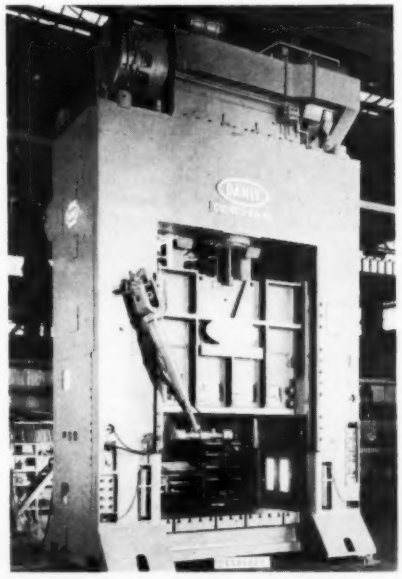


Danly 400-ton Autofeed press, complete with slide cushion, skip-type scrap cutter, grip feed, and coil loading car.

Yes, sales figures show that The O. Hommel Company during the last 10 years has supplied more WHITE FRIT for DIRECT-ON steel applications than would be needed to porcelain enamel the Pennsylvania Turnpike from Pittsburgh to Philadelphia . . . Over 300 Miles!!!

From the original Hommelaya process patented over 30 years ago, to the most recent developments in WHITE ONE-COAT APPLICATION, HOMMEL HAS PIONEERED in the research and production of DIRECT WHITE FRITS. This leading position in the industry has been maintained through continuous research, using the newest steels and metal preparation techniques and . . . HOMMEL DIRECT WHITE FRITS ARE VERSATILE! . . . can be used over groundcoat for assured uniformity where both methods are employed . . . Available for low, medium and high firing temperatures.

Our wide experience in the development, manufacturing, and servicing of not only direct white frits, but regular groundcoats and cover coats as well, is available to you. . . . See your Hommel representative for more details—Or contact us direct.

DEPT. MPM-1160

HOMMEL

THE O. HOMMEL CO.

PITTSBURGH 30, PA.

West Coast — 4747 E. 49th Street, Los Angeles, California

. . . especially when you roll-form <u>both</u> edges of the metal in one <u>pass</u> through the DUPLEX-PANEL LOCKFORMER®

Start with the inherent economies of *roll-forming* as against other forming methods—add the double speed achieved with *two* forming heads instead of one—add the savings effected by using standard, mass-produced LOCKFORMER multiple station forming heads (with only the roll sets made to your specs)—and you come up with some cost figures that make mighty pleasant reading.

Designed for continuous high production, the Duplex-Panel Lockformer roll-forms both edges of metal up to 18 gauge and in widths from 6" to 48" (with no restrictions as to length)—in one operation and at speeds of from 90 to 100 lineal fpm. It is capable of an infinite variety of forms, locks or contours with complete dimensional stability, piece after piece, and usually requires only one semi-skilled operator.

If you form sheet metal, by all means get the facts on this money-saving equipment. Write for our catalog or send us a print of the part you are forming.

manufactured by

THE LOCKFORMER COMPANY

Dept. MP, 4615 W. Roosevelt Road, Chicago 50, Illinois

In Canada: Brown Boggs Foundry & Machine Co., Ltd., Hamilton, Ont.

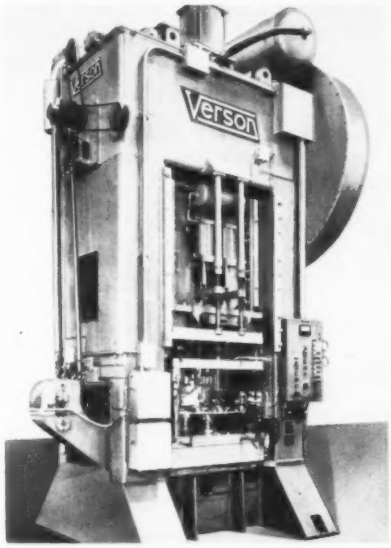
operations in the field of hydraulic presses and equipment during the past several years, Danly displayed a 100-ton hydraulic piercing machine equipped with the latest electrical design features.

In addition to the exhibit at the Exposition, Danly also held a display of presses and equipment at its main plant in Chicago. The plant display featured several large presses in operation: a 400-ton two-point double action model; a 600-ton two-point straight side press; a 300-ton two-point straight side press; and a 2000-ton triple action underdrive unit.

Verson Allsteel Press Co.

On the opening day of the Tool, Machinery and Production Engineering Shows in Chicago, representatives of the press were invited to Verson Allsteel Press Co. for a preview of the plant demonstrations which were carried on for the benefit of visitors to the combined shows.

While the Verson plant is impressive in its facilities for the production of



Verson 300-ton impact machining (cold extrusion) press equipped with two Trans-mat transfer feed mechanisms to produce two automotive wrist pins simultaneously.

presses of all sizes and complete automated specialized tooling setups, one of the latest pieces of production equipment is the Transmat-Impact machining press which utilizes the Transmat principle of mechanical fingers to move the piece part from one station to the next, and also utilizes the cold extrusion principle of impact machining. This type of equipment replaces automatic screw machines and the material consumption is said to be reduced by as much as 45 percent on specific items.

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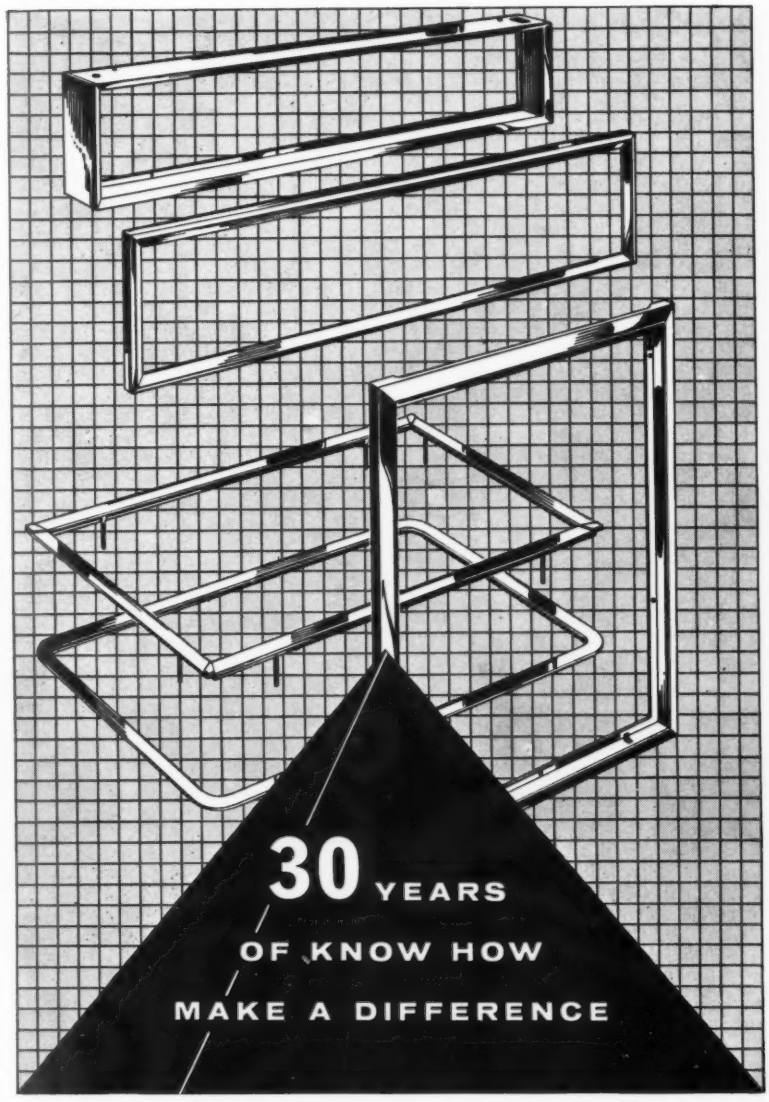

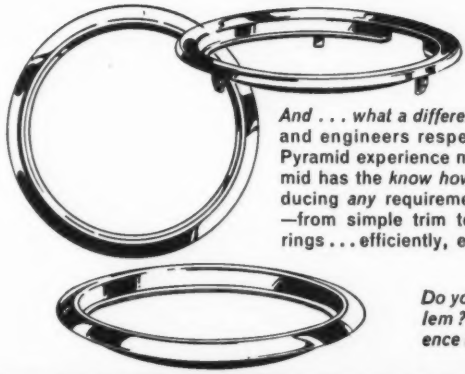

And . . . what a difference! Leading designers and engineers respect the difference that Pyramid experience makes. They know Pyramid has the *know how* for planning and producing *any* requirement in metal mouldings —from simple trim to complex frames and rings . . . efficiently, economically.

Do you have a moulding problem? Let us put this experience to work for you . . . today!

Pyramid Mouldings Inc.

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DETREX 910

CLEANS AND PHOSPHATE COATS

ELIMINATES HARDWATER PROBLEMS—CONTROLLED PH

DOES IT WITH BOTH BARRELS

NOT THIS...

BUT THIS...

Here's a brand new approach to iron phosphate coating.

Detrex 910 chemically cleans and phosphate coats in one operation. It is designed for use in continuous mechanical spray washing equipment ranging from a 2 to a 6 stage operation.

ARE YOU IN A HARD WATER AREA? This field tested and fully guaranteed product is so compounded that it will accept at least fifteen times more alkali than other products and still remain in the PH coating range to produce superior iron phosphate coating. This unique alkali tolerance permits Detrex paint-bond 910 to be used in practically all areas of the United States without special PH control.

It's a "double-barreled" advancement that can mean important savings to you. Our field engineers will be glad to furnish the details.

DETREX CHEMICAL INDUSTRIES, INC.

P.O. Box 501, Dept. MPM-1160, Detroit 32, Michigan

Icemaker Division Formed

Establishment of a new Icemaker Component Div. to develop and market current and future automatic icemaker units for use in refrigerator-freezers and self-contained icemakers was announced recently by Whirlpool Corp. Vice President R. B. Willemin.

Willemin stated that "establishment of the new division reflects the continuing growth of consumer demand for refrigerators with the convenience of completely automatic ice cube supply."

D. W. Vaughn, former director of industrial relations at Whirlpool's refrigeration division, will be general manager for the new division.

Unitary Air Conditioners Up 15% in First 6 Months

Manufacturers' shipments of unitary air conditioners reported to Air-Conditioning and Refrigeration Institute for the first six months of 1960 totaled 185,474 units, excluding coils, a gain of 15 per cent over first-half shipments in 1959.

The shipment figures include unitary heat pumps, but do not include room air conditioners, reversible or otherwise. Self-contained unitary heat pumps shipped in the first six months of 1960 — 13,261 units — were 35 percent ahead of 1959. It is estimated that units reported to ARI represent more than 90 percent of the industry total.

Admiral Licenses Two Firms

Admiral International Corp. has announced the licensing of two manufacturers to produce its products in Austria, Syria and Egypt.

Norman E. Johnson, president, said that Weag A. G. of Vienna has been licensed and will be provided technical assistance in the manufacture of Admiral television and radio receivers and phonographs for the Austrian market. Weag A. G. already distributes Italian-built Admiral refrigerators in Austria.

The second firm to be licensed is M. Said Hafez and Sons of Damascus, Syria, which will produce refrigerators, freezers and room air conditioners for sale throughout Syria as well as Egypt. This brings to 12 the number of countries outside the United States in which Admiral products are manufactured.

Mueller Wins Theobald Award

John Mueller, Day and Night Mfg. Co., was named winner of the 1961 Annual Art Theobald Achievement Award at the first 1960-61 fiscal year bi-monthly meeting of the West Coast Chapter of the Gas Appliance Engineers Society.

Included on the meeting program were a tour of a gas compressor station and a movie dealing with the laying of high pressure gas line. Walter Kennedy, Charles Koch and Associates, assumed his duties as president of the chapter for the current fiscal year.

ASTME Western Conference

Opportunity to view manufacturing procedures of plants producing such diverse items as guided missile systems, DC-8 jet liners, and grocery bags, will be given members and guests attending the ASTME 1960 Western Engineering Conference and Exhibit in Los Angeles, November 14 to 18.

The exhibit is said to be the largest production equipment exposition on the West Coast. More than 250 exhibitors expect to display over 2000 products.

New Universal Cabinet Office

The Universal Cabinet Div. of Universal Metal Products Corp. has moved into new general office headquarters at 5661 Natural Bridge Ave. in St. Louis.

The new offices include over 3000 sq. ft. of space for the divisions' administrative, marketing and sales personnel. The division handles the sales and distribution of Universal cabinets, a complete line of refrigerated units for ice cream, frozen foods, milk and other dairy equipment, which are produced in a new 200,000 sq. ft. plant in Conway, Ark. Universal Metal Products is a subsidiary of Universal Match Corp.

Studebaker Acquires Clarke

Clarke Floor Machine Co. of Muskegon, Mich., is now a division of Studebaker-Packard Corp. Clarke produces floor maintenance equipment, including floor maintainers, heavy-duty wet-dry vacuum cleaners, rug and upholstery shampoo machines, power sweepers, floor sanding machines and edgers. The company will operate as an autonomous division of Studebaker-Packard Corp.

Maytag Offers Dealers Appliance Reconditioning Plan

The Maytag Co. is offering appliance dealers an opportunity to increase their profit potential through a carefully conceived and executed plan of appliance reconditioning.

The new program, announced at a Chicago press conference in late September, is aimed at turning the "nuisance" of traded-in appliances into a profit and reputation-building asset. As explained by Maytag General Service Manager S. R. Payne, the Guaranteed Performance Appliance program "instructs dealers on how to organize and maintain effective reconditioning-marketing procedures of their own."

Pointing out that 54 percent of new automatic washer sales involve trade-ins, Payne said that the reconditioning program will help a dealer regain profits which often are lost on substantial trade-in discounts.

All Maytag franchised dealers are eligible to participate in the GPA program, subject to approval by Maytag's regional and branch managers. While the GPA program is aimed at reconditioning traded-in Maytag appliances, the procedures may be applied to other brands.

When a dealer is approved for participation in the program he receives a GPA manual which contains instructions on evaluating used appliances, how to recondition those selected, and how to merchandise the finished units. In addition, the dealer receives assistance from the company's national field service organization in all phases of the program.

Accepted dealers also receive a special franchise certificate, GPA point-of-sale display material, and a supply of

A trade-in automatic washer is shown being reconditioned in the service department at Glen Johnson Appliance, Inglewood, Calif., recently franchised under The Maytag Co.'s Guaranteed Performance Appliance program.

tags which are attached to the reconditioned appliances. Payne terms these tags "one of the most important elements in the program."

The upper portion of the tag, which the customer retains after purchasing the appliance, describes the service guarantee, essential facts of the sale and a check list showing what the dealer did in reconditioning the appliance. The middle portion of the ticket outlines GPA's guaranteed exchange plan. Under this provision, the purchaser can be guaranteed full credit for the amount paid for the used appliance should he decide to exchange it for a new Maytag

or another GPA appliance within a period specified by the dealer. This portion of the tag may be detached if the dealer does not wish to incorporate this phase of the program.

Payne explained that the length of the service guarantee is up to the discretion of the indivdual dealer, although the guarantee must be set for a minimum of 30 days.

When asked whether the GPA plan would have a negative effect on the sale of new appliances — specifically home laundry equipment — Payne said he didn't expect sales of new Maytag equipment to suffer. Some customers who are in the market for economical laundry equipment, he explained, are expected to purchase reconditioned equipment from the GPA-franchised Maytag dealers rather than "low-priced" new units of other makes. When these customers are ready to buy new equipment, the Maytag dealer is figured to have the "inside track" because of the previous sale. Thus Maytag feels that the program will ultimately stimulate business both for the company and the dealer.

API Builds New Plant

A recent ground-breaking ceremony inaugurated a new building expansion program for Allied Precision Industries, Inc., of Geneva, Ill. They have manufactured electric heating equipment, decorative anodized aluminum trim and ordnance electrical wiring components at their present site since 1953.

Binks Forms New Department

Binks Mfg. Co., Chicago, has established a Customer Demonstration and Service Dept. "to meet the increased demand for customer service brought about by the expansion and diversification of the product line."

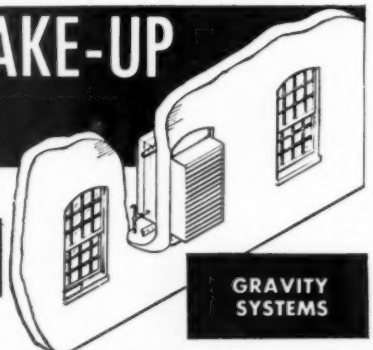
Through the services of the new department, existing and potential customers of Binks will be able to analyze various finishes for their product by testing it under controlled, laboratory conditions.

Robertshaw-Fulton Opens Eastern Research Center

Robertshaw-Fulton Controls Co.'s new Eastern Research Center, devoted to research and development of appliance, industrial and military control devices, opened officially September 29.

The research facility, located in King of Prussia, Pa., houses 18,000 sq. ft. of laboratory, test and office space for approximately 50 employees working in the fields of chemistry, physics, electronics, mechanics, gas technology and

AIR MAKE-UP UNITS
BY KOCH

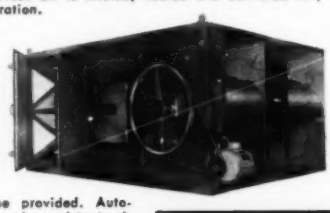


GRAVITY SYSTEMS

Koch Gravity Air Make-Up Systems are economical and efficient . . . save fuel and power . . . use throw-away filters. Available with gas or steam heating units. Have weather louvers outside — diffusion surface inside.

Installed in a factory window to replace air exhausted from process equipment. The vacuum created in the factory by this exhaustion is relieved by air drawn through the gravity unit. Fresh air is filtered, heated and delivered only when process equipment is in operation.

Koch Forced Air Replacement Systems are quiet and automatic. Carefully engineered control systems assure accurate and consistant air volume and temperature. Available with gas or steam heating coils.



Furnished in four basic sizes delivering from 6,000 to 28,000 c.f.m. Either diffusers at the blower or ducts for plant wide distribution of air can be provided. Automatic controls assure accurate and consistant air delivery and temperature.

BLOWER SYSTEMS

Call Koch for free engineering analysis of your heating, cooling, ventilating or exhausting problems . . . over 50 years experience serving American industry.

GEORGE KOCH SONS, INC., EVANSVILLE 4, INDIANA

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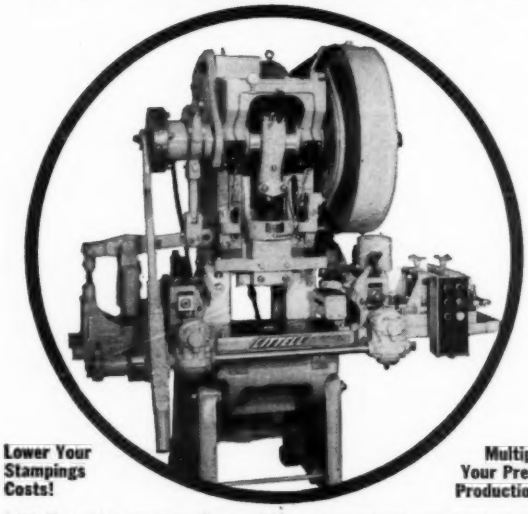

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Littell engineered to fit readily on standard straight sided and OBI Presses. Feed thick or thin stock up to 72" wide at the speeds required for new efficiency and economy in your stampings production.

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Ing-Rich Frit customers enjoy a tremendous advantage in "Plant Tested Frits"—*PLUS*—valuable guidance and trouble shooting assistance from our plant trained enameling technicians and ceramic engineers.

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for porcelain furnaces •
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BUILT TO YOUR SPECIFICATIONS

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The exact motor you need may not exist in any catalog . . . but a quality Thor SpeedMotor, engineered to your specific requirements can be custom-designed and produced for your application . . . at your price! Our broad facilities, fast service and engineering know-how can increase your final assembly efficiency . . . decrease your product cost.

X type (3" x 4") with gear case illustrated. For small and large appliances bar-b-ques, office machines, displays, etc.

See our catalog in Sweet's Product Design File—or give us your specifications and we'll design and build you a CUSTOM SAMPLE

SpeedWay Mfg. Co.
Division of Thor Power Tool Co.
LaGrange Park, Ill.

Thor SpeedMotors

air conditioning. The building was completed in 1959 at a cost of approximately $600,000.

Scientists and engineers at the center are engaged primarily in research and development of electronic, electromechanical, pneumatic and thermal devices; heating and refrigeration systems; and process control systems. William M. Harcum is general manager of the center and George Revesz is technical director.

Ransburg Marks 50th Year

Harper J. Ransburg is celebrating 50 years in business this year. The business was formed in 1910 when Ransburg purchased a small glass cutting shop in Toledo, Ohio, to produce the type of merchandise he had been selling for other manufacturers. The operation moved to Indianapolis in 1912, and ten years later the company expanded into the painting and decorating field. Ransburg's son Harold developed the electrostatic spray painting technique.

Today Ransburg electrostatic process is being marketed in Canada, the United Kingdom, continental Europe, Australia and New Zealand, with associate offices and laboratories in London, Germany, France and Australia.

Harper J. Ransburg (right) receives a plaque commemorating his 50th anniversary in business from William H. Book, executive vice president of the Indianapolis Chamber of Commerce.

Polk Urges Service Training

The president of a large Chicago chain of home furnishings retail stores is urging vocational educators across the country to develop courses for training students in the field of appliance service.

Sol Polk, president of Polk Bros., explained the need for qualified service personnel in a letter to the educators, and suggested that the schools are logical training grounds.

"Incorporating a program for training students in the service and repair of household appliances . . . into your existing curriculum of industrial and vocational training would provide your community with a growing supply of service people and would, incidentally, contribute greatly to the youths' sense of dignity," the letter read.

Pointing out that Polk Bros. has contributed many used appliances to schools and institutions for training purposes, Polk said schools should be able to obtain a sufficient supply of these used products from local appliance distributors.

If schools are unable to obtain these used appliances, Polk offers to get local programs underway by donating a truckload of traded-in products, including washing machines, refrigerators, television sets, electric ranges, and power lawn mowers.

W-R Acquires Robinson Tube

White-Rodgers Co. has announced the acquisition of the gas burner manufacturing assets of Robinson Tube Fabricating Co., Conway, Ark.

The manufacture of gas burners for use on appliances, hot water heaters and gas-fired furnaces formerly carried on by Robinson Tube will be integrated with the activities of Configured Tube Products Co., a wholly owned subsidiary of White-Rodgers.

Bohn Expands Danville Plant

Construction is underway on a 28,000 -sq.-ft. plant addition to the Danville. Ill., division of Bohn Aluminum & Brass Corp. Completion is expected before the end of the year and will bring the total plant area of the division to 171,000 sq. ft.

More News on Page 76 →

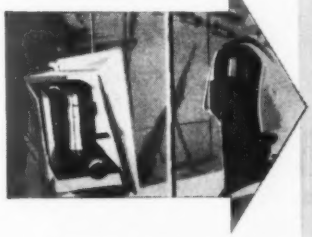
Here's the
PHOSPHATE COATING
You asked **TURCO TO MAKE**

HERE'S HOW PAINTITE® SCORES ON SURVEY'S 12 "MOST WANTED" FEATURES...

–Formulated as Result of Industry-Wide Survey...

During the first six months of 1959, Turco undertook an extensive survey of the phosphate coating market. Hundreds of users of these coatings were interviewed. Thousands of questions were asked. When the answers were tabulated, Turco began the task of building an iron phosphate process to the *exact specifications* called out in the survey.

The new process is now available. It is called Turco Paintite. Paintite has been thoroughly field-tested in the production lines of a dozen Turco customers. It has passed the most severe tests with flying colors. Turco is proud to announce the addition of Paintite to its ten other Turcoat phosphate and conversion coating processes that provide a better bond for organic finishing.



1. **SUPERIOR CLEANING**–Exclusive wetting system provides heavy-duty uniform cleaning. Cleans & phosphates simultaneously.
2. **TEMPERATURE VERSATILITY** – Efficient anywhere within range of 140° to 180°F. Temperature control is not important.
3. **LOW FOAMING** – at any temperature within recommended range.
4. **LESS POST RUST** – Eliminates post rusting problem often encountered with iron phosphate processes.
5. **NO WHITE STREAKING** – Extra free rinsing. Leaves no residue.
6. **ECONOMICAL**–Low in initial cost. Low in maintenance cost. Low in cost per sq. ft. Long-lived, even under mass production use.
7. **UNIFORM COATING** – even on edges and points. Won't show through on low-pigmented paints.
8. **USE VERSATILITY** – used by immersion, spray washer or steam cleaner.
9. **LESS SLUDGE** – less scale. Minimizes clean-up problems.
10. **RESERVE ACIDITY** – combats alkaline water conditions. Constant control not necessary.
11. **SUPERIOR SERVICE** – by Turco's vast network of technically trained servicemen, located in industrial centers throughout the world.
12. **REQUIRES ONLY 3 STAGES** – for dip or spray washing. Can be efficiently used in 5-stage operations, if desired.

FREE! VALUABLE BOOKLET
PHOSPHATING REFERENCE CHART
TECHNICAL DATA BULLETIN

Get the full story on Paintite and the other ten phosphating and conversion coating processes in the complete Turcoat line. Write for your copy, along with Turco's Phosphating Reference Chart, today!

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TURCO PRODUCTS, INC.
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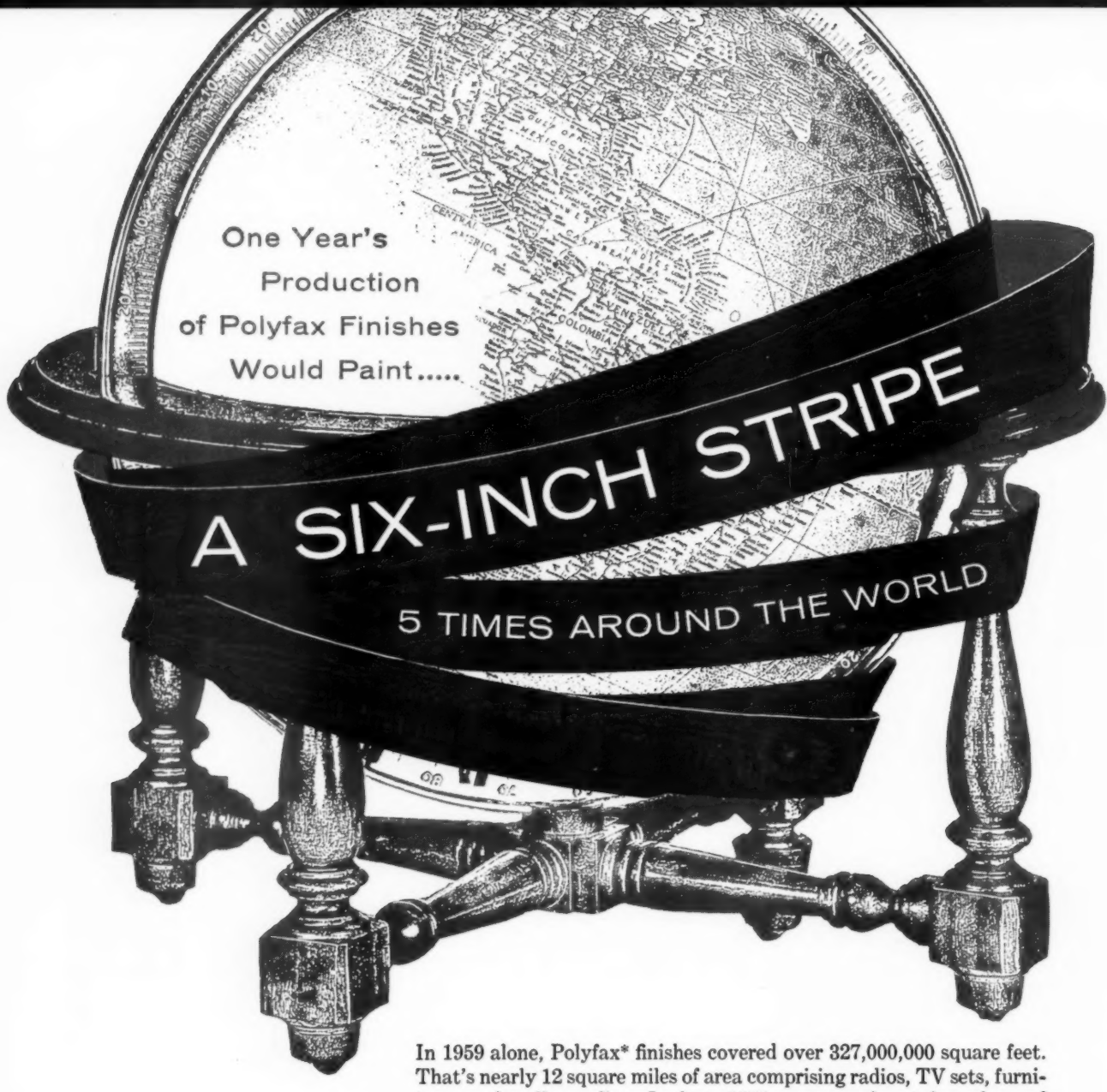
MERELY AFFIX COUPON TO COMPANY LETTERHEAD

Please send valuable booklet with Phosphating Reference Chart and full details on Paintite. I understand there is no cost or obligation on my part.

NAME

TITLE

MP



In 1959 alone, Polyfax* finishes covered over 327,000,000 square feet. That's nearly 12 square miles of area comprising radios, TV sets, furniture, and wall paneling. In fact, 1959 saw records set for sales and acceptance by manufacturers and consumers alike.

In the Polyfax process you find an almost incredible realism in the reproduction of the most delicate wood grains, leather or fabric textures, and even patterns or designs of your own creation. These can be reproduced faithfully by Polyfax, on such diverse substrates as wood, plastic, steel, and composition board.

Here is a finishing process designed specifically for application to your production problems and techniques. A system of interrelated components; precision engravings, ground coats, inks and clears "job selected" to turn out miles of high fidelity reproductions day after day, month after month with a minimum of rejects.

Can your product use a new look? Write today for your copy of the booklet, "The Key to Distinctive Styling." Learn how the IC* Polyfax system turns a reproduction into . . . a photo finish of the real thing!

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COMING FEATURES

DESIGN

A NEW COMBINATION WASHER-DRYER

NEW CONCEPT IN DISHWASHER DESIGN

ENGINEERING DETAILS OF THE MATHES HEAT PUMP

FABRICATION

FABRICATING ALUMINUM BASE ALLOYS
(LAST INSTALLMENT OF 3-PART FEATURE)

FABRICATION AT SPEED QUEEN

FINISHING

A SURVEY OF THERMOSETTING ACRYLIC PAINTS

EVOLUTION OF AN INFRA-RED PORCELAIN ENAMELING FURNACE

GENERAL

HOW A STAMPING PLANT WENT OEM

RESEARCH AND DEVELOPMENT FACILITIES AT WESTINGHOUSE (COLUMBUS)

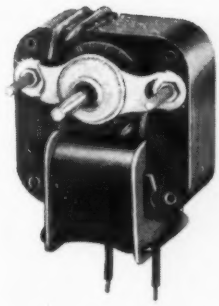
STANDARDIZATION IN APPLIANCE DESIGN

OPERATION OF A 12-PLANT QUALITY CONTROL SYSTEM

MPM STAFF REPORTS ON MAJOR INDUSTRY MEETINGS

★★★★★★★★★

BREVEL



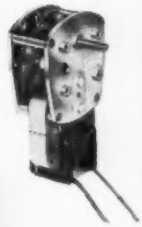
This shaded pole motor is available as a high speed motor alone or as the backbone of BREVEL's quality gear motors.

every day Brevel meets unusual specifications for small motor applications

Your new appliances get into production—and to market—faster, at lower cost when BREVEL supplies your motors. Chances are we have a suitable design!

You can rely on BREVEL's experienced specialization to design, engineer, and volume-produce precision motors that give consistently superior service at low cost.

Our representatives cover every part of North America from local offices. Write, wire, phone NOW . . . and find out.



Series S
Open Spur
Gear Motors

Series W
Open Worm
Gear Motor

NEW! Compact
Low Noise
Series FB
Enclosed Helical
Gear Motor

BREVEL

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MEXICO CITY: Arturo A. Aquilar • INdependencia 59-202 • Mexico 1, D.F.

Industry news

→ *from Page 73*

Infra-Red Firm Formed

The Infra-Ray Corp., specializing in infra-red heat applications, has opened offices at 1276 W. 3rd St., Cleveland, Ohio. R. F. Rush, president, and J. D. Campbell, vice president, are former Ferro Corp. employees.

Infra-Ray is the franchise distributor for the Perfection Schwank infra-red

CAMPBELL

RUSH

generators manufactured by Hupp Corp. The firm will also represent the John Fannon Products Co., designers and builders of infra-red industrial dryers, ovens, furnaces and complete finishing systems, including the Chemtronic paint spraying process.

Also represented by Infra-Ray Corp. is Ransohoff Co., Hamilton, Ohio, a manufacturer of equipment for the surface treatment of metals.

AIEE Conference Set For November 7 in L. A.

Segments of the appliance industry including home comfort, cooking, major appliances, small appliances and specialized products will be represented at the 2nd Western Appliance Technical Conference sponsored by the Los Angeles Section of the American Institute of Electrical Engineers.

The meeting will be held November 7 at the Biltmore Hotel in Los Angeles.

Subjects will be presented by qualified people from equipment manufacturers, component suppliers, public utilities (gas and electric), and private organizations devoted to safety. Morning and afternoon sessions will be devoted to papers concerning design applications, codes and standards; a seminar in the evening will undertake the subject, "What We Expect from an Appliance."

New Siding Plant Begun

U. S. Aluminum Siding Corp. has broken ground in Franklin Park, a Chicago suburb, for a new two million dollar plant called "the most modern and up-to-date of its kind in the industry."

The plant, expected to be in operation by March of next year, will have about 66,000 sq. ft. of operating space as well as offices. "Ultimately we expect to produce and market a complete range of all types of aluminum building products to provide complete exteriors for home through both building specialties dealers and new home builders," Board Chairman Harry Nassan said.

PMI Elects Officers

Officers for the coming year were elected at the annual meeting of the Pressed Metal Institute recently at Shawnee Inn, Shawnee-on-the-Delaware, Pa.

The new president is M. A. Sherwood, Grand Haven Stamped Products Co., Cleveland, Ohio. W. J. Primrose, Jr., The Dickey-Grabler Co., Cleveland, Ohio, and C. W. Cederberg, Larson Tool & Stamping Co., Attelboro, Mass., are vice presidents.

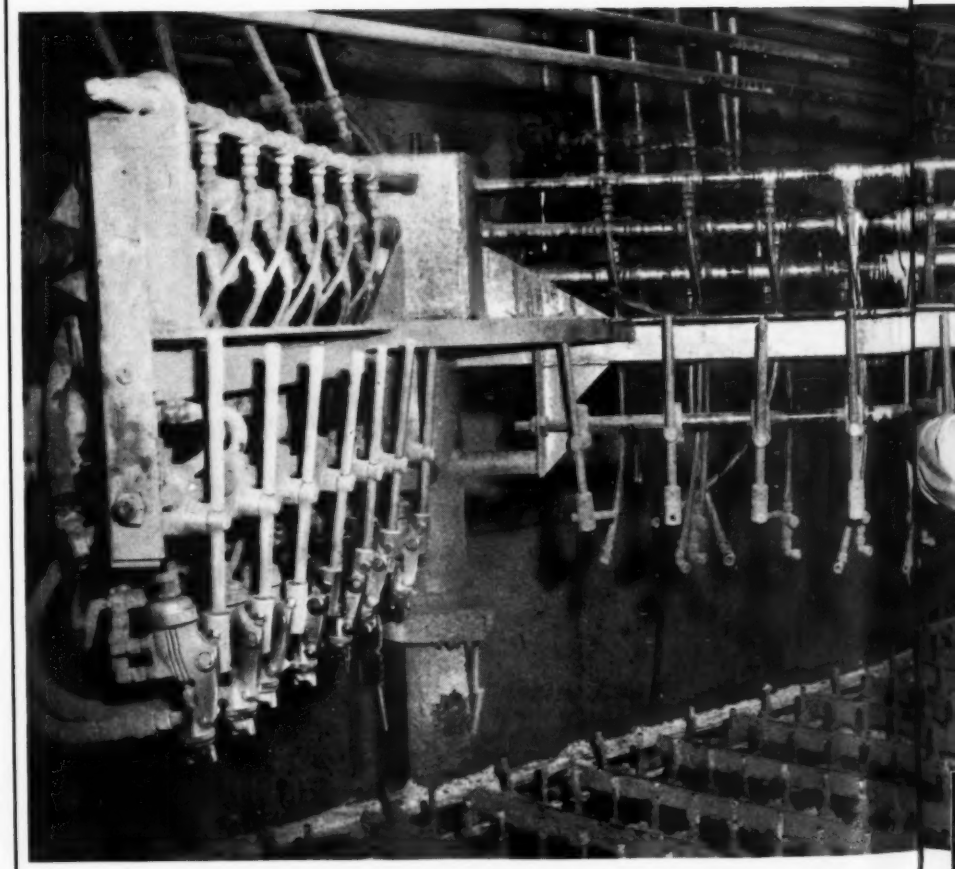
Secretary-treasurer is W. Bryant Gemmill, The American Stamping Co., Cleveland, Ohio; and Melvin Lorentz, HPL Mfg. Co., Cleveland, is honorary secretary-treasurer.

NEMA Meeting Set for Nov. 17

The 34th annual meeting of the National Electrical Manufacturers Association will be held Thursday, November

At Stran Steel Co., Terre Haute, Indiana...

color change-over time



Two horizontal arms, each with 7 mounted spray guns, turn on a shaft. Colors are changed simply by moving the arm into position with clean guns for a new color. This automatically swings other 7 guns that have been in production free of the line for cleaning. Change-over requires only 3 minutes.

17, at the Savoy Hilton, New York City.

Attendance at the meeting will be by invitation, and the day's program will be highlighted by a symposium of the industry's outstanding scientists discussing research and its practical implications to the electrical manufacturing field. Another feature will be a luncheon at which newly elected officers of the association will be announced and awards presented to three top member company executives for their outstanding contributions to the electrical industry and to the business community in general.

Norge Introduces Dry Cleaner

Norge Div. of Borg-Warner has unveiled a new automatic, coin-operated dry cleaner that will "multiply dry cleaning sales volume from five to ten times and build a new industry."

Resembling a clothes dryer or washer-dryer, the machine cleans and dries in one unit eight pounds for $1.50 in 45 minutes. Individual units are a part of a bank of eight machines, utilizing a specially formulated cleaning solvent from a single central source. The solvent, known as Norg-Clor, is re-used indefinitely through a process of filtration and purification.

"I predict that store by store, this cleaner will build another 'use-it-yourself' industry. I see in it a strong parallel to the automatic washer, which revitalized the appliance business and created a new industry," declared Judson S. Sayre.

...reduced to 3 minutes

600 feet of synchronized equipment at Stran Steel Co. scrubs, bonds, washes, cures, applies and bakes the finish on formed metal roof and sidewall panels. Incorporated in this array of automation is a considerable amount of Binks equipment . . . spray and wash booths, guns, high pressure pumps and other automatic units.

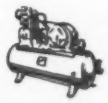
At one place in the line, a Binks high-speed rotary spray gun unit (consisting of 8 mounted spray guns) applies a uniform finish coat to all edges of the configurated sheets. And here's the remarkable feature in this operation . . . panel surfaces, flanges and radii are all finished to the precise mil thickness required.

This is just one of many ways Binks equipment meets particular requirements on the finishing line at Stran Steel. You, too, can have a time and material saving finishing line engineered to your particular needs. No matter what your product, or how complicated the finishing process, Binks has the engineering knowhow and the right finishing equipment to streamline your production.

Why not talk it over with a Binks engineer . . . it doesn't cost a penny and it may save you thousands of dollars.

Ask about our spray painting school
Open to all . . . NO TUITION . . . covers all phases

SPRAY GUNS



AIR COMPRESSORS

NATIONWIDE SERVICE

Binks
EVERYTHING FOR SPRAY PAINTING

Binks Manufacturing Company
3122-40 Carroll Ave., Chicago 12, Ill.

0964

REPRESENTATIVES IN PRINCIPAL U.S. & CANADIAN CITIES • SEE YOUR CLASSIFIED DIRECTORY

New Maytag Clothes Dryer Measures Fabric Moisture

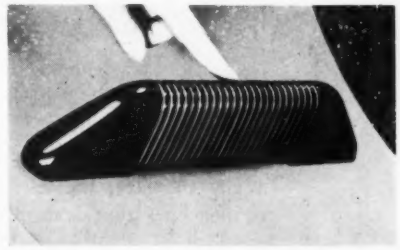
The possibility of overdrying is said to be eliminated in a new clothes dryer recently introduced by The Maytag Co.

Key to the new concept in the Magic Touch dryer is an electronic sensing system which automatically shuts off the dryer when the proper moisture content is reached. Moisture of the clothes is constantly measured during drying by three sensing elements mounted on the interior of the revolving drum. When the moisture level falls to a predetermined level, the sensing elements automatically cause the dryer to be shut off.

Maytag points out that residual moisture is found in all natural fibers. To retain the natural state of the fibers, this moisture must not be completely removed. When it has been eliminated by allowing the dryer to run too long, fabrics become harsh, crinkled and unpleasant to the touch, the company adds.

In addition to the three cycles incorporating the "moisture measuring" principle, the new dryer also offers two timed settings.

Other features of the dryer, which is available in either gas or electric models, include a safety door which stops all operations when opened; porcelain enameled drum; zinc-coated steel cabinet; four-way venting; and flush-to-wall or flush-to-cabinet installation.



Only visible component of dryer's electronic system is the moisture-sensing element on each of the three baffles attached to the interior of the revolving drum. When the moisture level falls to a predetermined level, the sensing elements automatically shut the dryer off.

2 Millionth Heating Unit Celebrated by Temco, Inc.

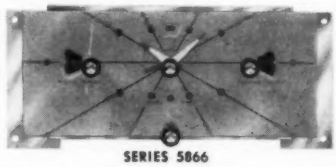
Temco, Inc. of Nashville, Tenn. recently celebrated the production of its two millionth gas heating unit.

Highlight of the celebration was a five-day trade fair with Temco and 21 of its suppliers exhibiting. The fair, first regional industrial products exhibition ever held in Nashville, drew an estimated attendance of 10,000.

More News on Page 80 →

LUX

the appliance TIMER LINE that features FULL application flexibility



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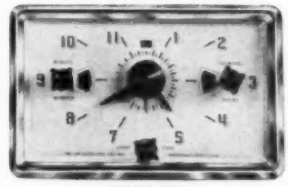
SERIES 1600

SERIES 2500



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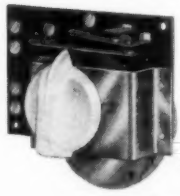

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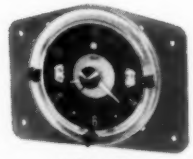

SERIES 5600

In any industry, the design engineer's demands are best satisfied by product lines that feature standout performance *and* wide application flexibility . . . which is what the Lux line features *exactly*.

As shown, Lux offers quality timers in a variety of sizes and shapes that satisfies virtually any appliance application requirement. Each unit is a fine example of fashion and proper function effectively combined . . . each one a keen instrument, with accuracy and reliability guaranteed by the LUX LIFE-TEST through which a prototype of every Lux product successfully must pass before it is marketed.

Better components obviously mean better appliances. Whatever your timer need, look confidently to the Lux line . . . first in fashion . . . infallible in function . . . fully flexible in application.

LUX . . . first . . . for lasting TIME

DEPARTMENT MPM

THE LUX CLOCK MANUFACTURING COMPANY, INC.

95 JOHNSON STREET • WATERBURY, CONN.

MPM

industry meetings

METAL TREATING

The First Metal Treating Symposium, New Englander Motor Hotel, Westport, Conn., November 3, 1960.

HOME LAUNDRY

The American Home Laundry Manufacturers' Association's Conference, San Francisco, Calif., November 3-4, 1960.

APPL. TECH. CONFERENCE

The West Coast Appliance Technical Conference, sponsored by the American Institute of Electrical Engineers, Los Angeles, Calif., November 7, 1960.

CHEMICALS

Canadian Chemical Engineering Conference, sponsored by the Chemical Engineering Div. of the Chemical Institute of Canada, Quebec City, Canada, November 7-9, 1960.

DIE CASTING

First National Die Casting Exposition and Congress, Detroit Artillery Armory, Detroit, Mich., November 8-11, 1960.

HEATING & AIR CONDITIONING

The 47th Annual Convention of the National Warm Air Heating and Air Conditioning Association, Statler-Hilton Hotel, Cleveland, Ohio, November 14-16, 1960.

ENGINEERING CONFERENCE

The 1960 American Society of Tool and Manufacturing Engineers' Western Engineering Conference and Exhibit, Memorial Sports Arena and Ambassador Hotel, Los Angeles, Calif., November 14-18, 1960.

SHOP PRACTICE FORUM

Porcelain Enamel Institute's Shop Practice Forum, Urbana-Lincoln Hotel & University of Illinois, Urbana, Ill., November 16-18, 1960.

ELECTRICAL MANUFACTURERS

The National Electrical Manufacturers' Association's Annual Meeting, Savoy-Hilton, New York City, November 17, 1960.

AIR CONDITIONING & REFRIGERATION

The Air Conditioning and Refrigeration Institute's 1960 Annual Meeting, Hollywood Beach Hotel, Hollywood Beach, Fla., November 18-22, 1960.

STOVE & FURNACE MANUFACTURERS

The Canadian Institute of Stove & Furnace Manufacturers' Annual Meeting and Workshop, Laurentien Hotel, Montreal, Canada, November 21-22, 1960.

HOUSEWARES

The National Housewares Manufacturers' Association's 34th National Housewares Exhibit, McCormick Place (Lakefront Exposition Center), Chicago, Ill., January 16-20, 1961.

MAINTENANCE & ENGINEERING

The 12th Annual Plant Maintenance & Engineering Show, International Amphitheatre, Chicago, Ill., January 23-26, 1961. (Show; January 23-26: Conference; January 23-25.)

We don't think You can Avoid it...

..or that You'll want to..

We're talking about the use of Pre Finish Metals.

A fabricator of metal products eliminates many production and design limitations through the use of Pre Finish Metals. Pre Finish Metals, Incorporated provides organosol, plastisol, epoxy, vinyl, acrylic or alkyd base finishes.

Laminate films such as DuPont Teslar,* wood grains, printed and embossed finishes are available in any of the above coatings - or on any metal.

You can roll, form, draw, punch or stamp without marring the finish.

Pre Finish Metals, Incorporated provides the widest coated flat sheet in the industry - 18" to 60" widths.

There is a new era in the fabricated metals field and Pre Finish Metals is part of it.

*Dupont's trademark for it's PVF Film

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INCORPORATED
COATERS OF CONTINUOUS COIL

Formerly: All Weather Steel Products, Incorporated
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Industry news

→ *from Page 77*

Premier Reports Record Sales

All-time records in volume, earnings, working capital, and shareholders' equity were set by Premier Industrial Corp. during the year ended May 31. Premier is engaged in the design, development, and marketing of automotive and industrial fasteners, welding supplies, and other components used exclusively in repair and maintenance work.

Capital Appropriations Down 11%

The top 1000 U. S. manufacturers ticketed $2.3 billion in new capital appropriations during the second quarter of 1960, 11 percent less than in the same 1959 quarter, according to the Newsweek Quarterly Survey of Capital Appropriations, conducted by the National Industrial Conference Board. It was the first year-to-year drop in 18 months.

The slowdown in appropriations spread throughout most industries; only non-ferrous and fabricated metals, photographic equipment, paper and rubber were up. Steel makers chopped new appropriations by nine percent, auto manufacturers reduced appropriations 39 percent, the survey reported.

IAM Elects New Officers

Sol Goldin, manager of retail marketing for the Whirlpool Corp., St. Joseph, Mich., has been announced as the new president of the Institute of Appliance Manufacturers. He succeeds F. H. Guthrie, president of The Newark Ohio Co.

GOLDIN

Prior to his election to the presidency, Goldin served four years as a trustee and has been a member of the organization for most of its 28 years. He brings to his new position experience as an appliance retailer, distributor and manufacturer. He held a succession of positions with Sears, Roebuck and Co., Temco, Inc., Athens Stove Works, Henry N. Clark Co., Goldblatt Bros, Strawbridges' Clothier Co., and Jordan Marsh department stores. He joined Whirlpool in 1955 as product manager of the RCA-Whirlpool range division.

Other officers elected were A. B. Ritzenthaler, The Tappan Co., executive vice president; E. Carl Sorby, Geo. D. Roper Corp., secretary; and S. B. Rymer, Jr., Dixie Products, Inc., treasurer.

Film Promotes ARI Program

Another publicity and promotion tool in the Air-Conditioning and Refrigeration Institute's certification program has been completed and is being offered to local associations of home builders throughout the country to promote residential air conditioning generally and certified unitary equipment specifically.

The new tool is a 15-minute filmgraph in color, which is designed to give home builders some fundamentals in designing for air conditioning — including need for ventilation, insulation, orientation, roof overhang — and adding, as another fundamental, the necessity for use of ARI-certified unitary equipment.

McKay Subsidiary Builds Square and Bevel Shear

The Metal Processing Machine Co., Youngstown, Ohio, a subsidiary of The McKay Machine Co., has been licensed to manufacture, sell and service a new shear designed by Corpet Louvet et Cie., Paris, France.

The Corpet Louvet square and bevel shear is basically a standard hydraulic square shear with both the square knife and the beveling knife mounted on one

to Page 94 →

Industry's NEWEST Production TOOL

MOLYKOTE® G LUBRICANT

- ALMOST 100% SAFETY AGAINST GALLING AND SEIZING WITH ALL BEARING METAL COMBINATIONS
- ELIMINATES STICK-SLIP, METAL PICK-UP AND DISTORTION IN PRESS FITTING
- REDUCES WEAR-IN TIME AND DAMAGE IN NEW OR REBUILT MACHINERY
- THE HIGHER THE LOADS, THE GREATER THE MARGIN OF SUPERIORITY OF MOLYKOTE G

Write for your free sample of MOLYKOTE G LUBRICANT today. We will also send you a copy of our new Bulletin 126 which gives complete details. THE ALPHA MOLYKOTE CORPORATION, 65 Harvard Avenue, Stamford, Conn. Phone Fireside 8-3724. Plants in Stamford, Conn., Munich, Germany and Strasbourg, France.

MPM-11

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COMPANY_____
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HOLLOW CONE
in complete choice of spray patterns and capacities
FLAT SPRAY
CONTROLLED-FLOW*
SPRAY NOZZLES
*exact control of pattern, impact, volume and distribution for any liquid at any pressure.
FULL CONE
for better washing coating and rinsing
for complete information write for catalog NO. 24

SPRAYING SYSTEMS CO.
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MPM

new industrial literature

Color-Coated Stainless

An eight-page booklet titled "Color-Coated Stainless Steel" gives general information, characteristics, physical and mechanical properties, and applications for colorcoated stainless steel sheet and strip. A separate color card showing complete color range is also included. Write Dept. MPM, Washington Steel Corp., Washington, Pa.

Bronzeless Gold Finish

A new folder describes Bronzeless Gold, a spray finish which simulates the appearance of fine bronze powders. Included in the folder are product data on Bronzeless Gold finishing systems for metals and thermoplastics, color chips of standard colors, and typical applications by appliance and electronic manufacturers. Write Dept. MPM, Bee Chemical Co., 2700P E. 170th St., Lansing, Ill.

Pilot Light Catalog

A line of pilot lights designed for up to 25,000 hours of operation is described in a recently published catalog. The catalog explains how Omni-Glow pilot lights are easily attached to panels of any thickness by a vibration-proof speed nut. The lights are available in a variety of styles to meet a wide range of design requirements.

Write Dept. MPM, Industrial Devices, Inc., Edgewater 13, N. J.

Mash Seam Welding

Advantages of mash seam welding as a high-speed, high-strength, low buildup method of coil joining are described in a new catalog. The illustrated six-page publication describes in detail engineering specifications and work range of 11 types of special and standard automatic coil joining welders, including mash seam, spot, arc, and lap seam equipment to meet every industrial requirement. For a copy of Welding News, Vol. 12—No. 1, write Dept. MPM, National Electric Welding Machines Co., 1846 Trumbull St., Bay City, Mich.

Hydraulic Platen Presses

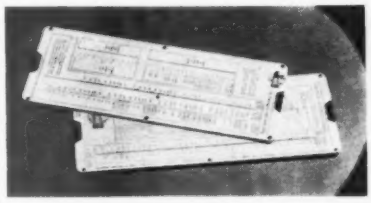
A new catalog describing a complete line of hydraulic platen presses has just been published. The catalog includes specifications and descriptions of presses from 25 to 500-ton capacity. Presses are included for compression molding, bonding, laminating, trimming and piercing operations and for laboratory work. Write Dept. MPM, Danly Machine Specialties, Inc., 2100 S. Laramie Ave., Chicago 50, Ill.

Decorative Trim Laminates

A four-page brochure describing self-adhesive Mylar-vinyl laminates for decorative trim has recently been published. Swatches affixed to the brochure are included as an aid to designers, converters and other users of decorative trim materials. These include 17 different types of patterns and finishes in the stock line. Write Fasson Products, Dept. MPM-99, 250 Chester St., Painesville, Ohio.

Free Strapping Calculator

A new strapping calculator helps correlate strapping orders to requirements. For any of the 27 stock sizes and kinds of steel strapping offered by the company, the calculator solves seven types of problems: computes the pounds of strapping needed for a given package size, whether rectangular or round; figures the total strapping necessary for a given production run; calculates the strapping cost per unit for any package; establishes the total strapping cost per unit for any package; computes the cost-per-foot for each strapping variety; shows number of feet per pound and tensile strength for each stock size and kind of steel strapping; and indicates the quantities at which favorable price breaks are available.



Each basic step in operation of the calculator is printed clearly and briefly on the face. Examples and detailed instructions are in an accompanying booklet. The calculators are available free to users of steel strapping.

Write Strapping Catalog, Special Projects Editor, Metal Products Manufacturing, York St. at Park Ave., Elmhurst, Ill.

Super 30 Fabricator

A multi-purpose, single-station sheet metalworking machine is described and illustrated in a new eight-page catalog. The catalog explains in detail how precision micrometric gauging on the Super 30 Fabricator enables the operator to position work faster and more accurately, and how swing-shift punch holders and drop-in die buttons allow tools to be changed in as little as 20 seconds. For a copy of Catalog 30S write Dept. MPM, Wales Strippit, Inc., Akron, N. Y.

Resistance Welders

A 12-page brochure describes and illustrates a line of resistance welders. Included in the brochure are several types of welding equipment, including spot, projection, seam, roll seam, portable, aircraft spot and seam, flash, multi-spot and automated machines. Write Dept. MPM, The Federal Machine and Welder Co., Warren, Ohio.

Batch Cleaning Bulletin

Industrial batch cleaning of electric motor parts, precision gears, typewriter and business machine parts, etc. is the subject of a new 12-page booklet.

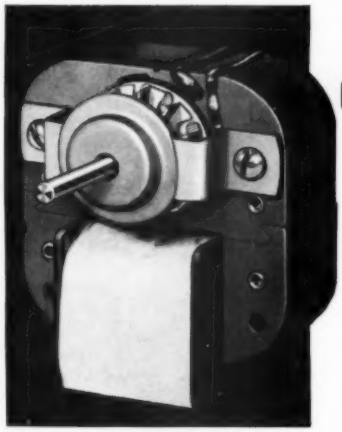
The importance of single-lever operation of cleaning machines, minimum supervision during cleaning cycles and complete automation of some systems is stressed. Illustrated are standard-model machines, special units, and individually designed and fabricated systems. Write Equipment Div., Dept. M-19, Magnus Chemical Co., Inc., Garwood, N. J.

Space-Saving Fans

The Centriline fan, an airfoil centrifugal fan with in-line flow, is discussed in a new catalog. According to the literature, the fan has the high efficiency characteristics of a centrifugal fan, yet requires less than half the installed space.

The 14-page booklet is well-illustrated with photographs, construction and installation diagrams, performance curves and tables. It includes sections on construction features, optional accessories, installation arrangements, and notes on specifying and applying the fan. The fan is said to be suited for general building ventilation, commercial and industrial air conditioning, industrial process supply and exhaust, and combustion air supply. For a copy of Catalog 1125 write Westinghouse Electric Corp., Dept. MPM-355, Hyde Park, Boston 36, Mass. *(More New Literature on Page 82)*

ALLIANCE MOTORS



dependable power... sensible cost

MODEL JS—a versatile, efficient, miniature power plant for business machines, vending machines and many control, switch and signal applications. Supplied from stock or customized to your specifications.

TYPICAL JS SPECIFICATIONS

Full Load RPM	Torque oz./in.	Watts	Amps	Weight
2900	2.70	29	0.57	1 lb. 2 oz.

MODEL JSG

An extremely quiet gear train motor used in TV tuners, remote controls, rotisseries and other appliances. Mounting, operating temperature, clutch or solenoid action, torque, RPM and many other characteristics can be varied in this Alliance motor designed to meet your individual application.

TYPICAL JSG SPECIFICATIONS

Output RPM	Torque oz./in.	Watts	Amps	Full Load H.P.	Weight
12-14½	165	25.5	0.49	.002	1 lb. 7 oz.

Write for complete catalog and price quotations

WORLD'S LARGEST PRODUCERS OF SUB-FRACTIONAL HP MOTORS FOR MOST USES INCLUDING STEREOPHONIC AND HI-FI EQUIPMENT

THE ALLIANCE MANUFACTURING CO.

(Division of Consolidated Electronics Industries Corp.) ALLIANCE, OHIO

Fastener Reference Booklet

A 16-page staked fastener information booklet has been published. Drawings and photographs are presented for the various types of flush, shoulder and self-installing fasteners. Write Dept. MPM, My-T-Grip Mfg. Co., Inc., 176 Broadway, New York 38, N. Y.

Wire Construction Design Manual

A new edition of a wire component and assembly manual features case histories of how design engineers were able to cut costs and improve the quality and sales appeal of their products through use of wire and strip metal components.

The newly revised manual also describes the principal types of wire available for component construction, the most popular finishes, wire sizes and the variety of end treatments, threading and forming treatments possible. Write MPM-Custom Design Dept., E. H. Titchener & Co., 57 Clinton St., Binghamton, N. Y.

Transfer Presses

A complete line of transfer presses is described in a recently issued eight-page brochure. The brochure describes in detail the five standard machines in the line as well as typical applications involving use of the machines for the high production of stamped and drawn parts. Write Dept. MPM, The Baird Machine Co., Press Div., 1700 Stratford Ave., Stratford, Conn.

Press Overload Detector

Automatic protection against costly die and press damage caused by "doubles," misfeed, buckling, thickness variations and pileups is explained in a new bulletin describing the patented Circuit Master Mark III Press Overload Detector.

Illustrated are the sensing elements and circuitry which, in case an overload occurs, stop the press before the die can strike again. By instantly detecting minute changes in normal die shut height due to malfunctions, the Mark III immediately disengages the clutch control. To obtain a copy of the Press Overload Detector Bulletin write Dept. MPM, Wintriss, Inc., 20 Van Dam St., New York 13, N. Y.

World Screw Thread Standards

Over 2000 screw thread standards from 33 countries are listed in the recently published "World Screw Thread Standards." Along with presenting the various standards, the guide gives the threads a common denominator of comparison.

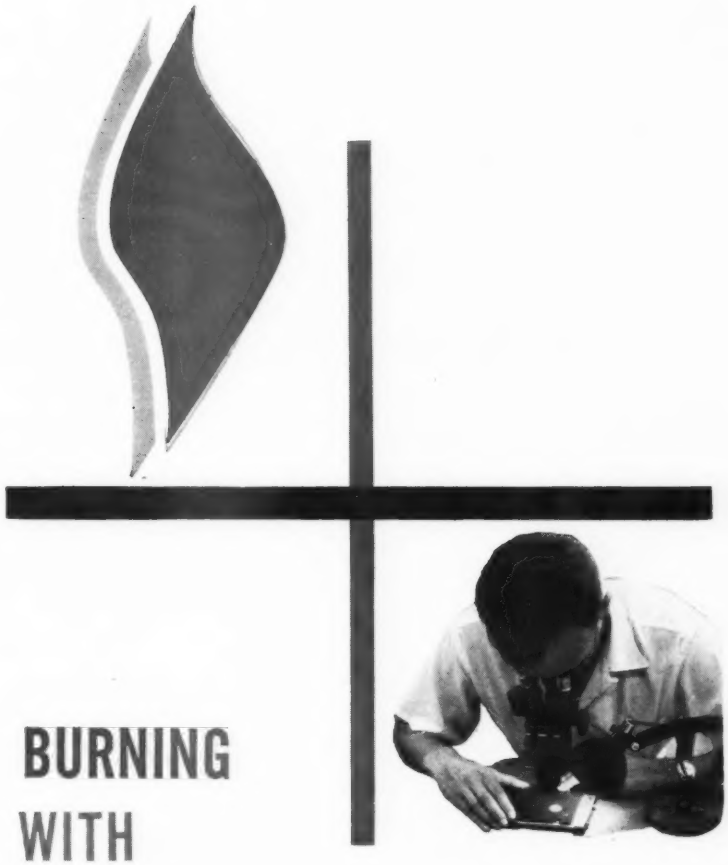
The introduction to the guide states: "The primary object of this guide is to help those who are interested in the production or supply of screw threads to national standards with which they are not familiar. The expansion of exports, and the possibilities of a new basis of trade in Europe may bring problems which this guide can help to solve."

Price of the screw thread guide is $1.50 per copy, post free. Write Dept. MPM, W. H. A. Robertson & Co. Ltd., Small Parts Div., Lynton Works, Bedford, England.

Cleaner and Rust Inhibitor

A cleaner that is said to thoroughly wash in-process parts and provide temporary protection agains rust is described in a recently issued bulletin.

According to the bulletin, the compound removes heavy soils when operated at temperatures up to 180° F., and also leaves a streak-free residual protective film that does not interfere with visual inspection. For more information write Dept. MPM, Oakite Products, Inc., 58 Rector St., New York 6, N. Y. Ask for Bulletin B-7484.



BURNING WITH AMBITION

For fifty years, Pemco has retained its enthusiasm for the unexplored. Today, the flame of research burns with even greater intensity. Pemco Research continues to lead the way toward further developments and improvements in low temperature and one-coat enamels to help you maintain highest product quality at lowest manufacturing cost.

FIFTY YEARS OF RESEARCH AND A FLAME

PEMCO CORPORATION

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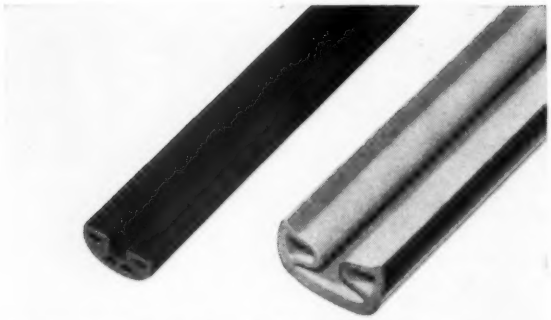
HIGH QUALITY PORCELAIN ENAMEL FRITS AND COLORING OXIDES



No matter what shape they're in...

CIPCO

(A DIVISION OF ESSEX WIRE CORPORATION)

produces high quality extruded plastic components for appliances, in quantity . . . competitively priced.

- **Control of Chemical Compounding**
  CIPCO formulates their own compounds (the first plant in the industry to do so) thus increasing the finished products capacity to resist aging.
- **Volume Production**
  Banks of extruders and years of production know-how guarantee on-time delivery of a quality component.
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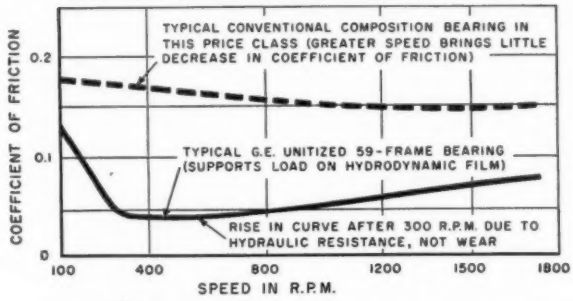
  Vast experience in the development of seal, vibration dampening gaskets and other plastic applications is available to help formulate an extrusion tailored to your application.

Write, wire or call for complete information and samples.

CAROLINA INDUSTRIAL PLASTICS
DIVISION ESSEX WIRE CORPORATION
Mt. Airy, North Carolina

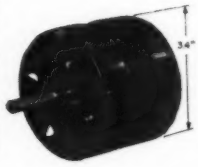
WEAR-FRICTION COMPARISON
GENERAL ELECTRIC VS. CONVENTIONAL MOTOR



New *Unitized** shaded-pole motor reduces bearing wear and noise

General Electric Unitized shaded-pole motors are designed to drive tape recorders, business machines, portable appliances, fans, and similar machines. A new lubrication system reduces bearing wear and noise. Thus, in normal operation, quiet sleeve bearings need re-oiling only once a year. These motors can be stud- or band-mounted at all angles. Available in open or enclosed models.

* Trademark of General Electric Co.



G-E Unitized motor. From 1/1000 to 1/15 hp, 1550 rpm, 4 pole.

FREE BULLETIN — Write to Section 727-01, Schenectady 5, N. Y.

GENERAL ELECTRIC

G = the Mark of Quality

In Trim Hardware, Your Best Bet Is To Call For Grigoleit

- ALUMINUM TRIM
- DECORATIVE METALS
- CHROMED HARDWARE
- STOCK EMBOSSED PATTERNS
- MOLDED PLASTICS

. . . all from press or rolled section tools — anodized — chrome plated — painted — silk screened — lithographed. All in our own plant!

For distinctive decorative trim . . . . bezels, control panels, escutcheons for ranges, refrigerators, freezers, washers, dryers and combinations. Add eye appeal — buy appeal to your product, choose Grigoleit!

FOR ALL CUSTOM-MADE OR STOCK TOOLED APPLIANCE HARDWARE, CALL ON —

THE GRIGOLEIT COMPANY
Over 30 Years in Plastics
740 E. NORTH ST., DECATUR, ILL.

MPM

personals

Donald G. Wilson has been named vice president-research of **P. R. Mallory & Co., Inc.** In his new post Dr. Wilson will supervise the electrophysical laboratories, chemical laboratories and materials laboratories of the company, and coordinate Mallory engineering and research activities throughout the country.

Oakite Products, Inc., has announced the election of **J. Justin Basch** as second vice president, and **William A. Baltzell** as vice president. Basch joined Oakite in 1925 as a representative in Pittsburgh, and Baltzell has been with the firm since 1941. Oakite also announced the appointment of **Peter J. Kornett** to the board of directors. He is general manager of manufacturing.

Roscoe C. Roe has been appointed manager of the **Crandal-Stone Div.** of **The Brewer-Titchener Corp.** The division produces plain and finished stampings, sub-assemblies and end product assemblies for many industries manufacturing industrial, commercial and consumer products.

George Barrie has been appointed sales manager of the **Coldform Div., H. K. Porter Co., Inc.** In his new position he will be responsible for all sales from both the Frankfort and Detroit Works which supply roll formed and stamped decorative and functional assemblies principally to the appliance and automotive industries.

S. M. Hopkins has been elected president and a director of the **National Can Corp. Robert Stuart, Harry N. Eidswick,** and **Frank O'Brien, Jr.** were elected vice presidents.

James D. Hopkins has been appointed national field sales manager of **Ironrite, Inc.** He formerly was regional sales manager of National Presto Industries, Eau Claire, Wis.

BROWN

BERGREN

STAHLSCHMIDT

SMUCK

Remington Rand Div. of **Sperry Rand Corp.** has made three management appointments. **Robert D. Brown,** vice president and general manager of the Remington Systems Div., has been named to the same capacity in the Office Machines Div.; **Francis V. Bergren,** formerly director of marketing for the Systems Div., has been promoted to vice president and general manager of that division; and **Howard V. Widdoes** is now attached to the group headquarters staff as vice president handling special assignments and industry relations.

James R. Whitlock has been appointed manager of the **Olin Aluminum** branch sales office at Louisville, Ky. He was previously an industrial sales representative for Olin Aluminum in the Chicago area.

John R. Strom, chemist and process engineer for the **Roto-Finish Co.,** has been appointed to the newly created post of technical director of the **Ransohoff Co.** Both firms are under the same management.

Howard F. Wilson has been named plant manager by **Aluminum Extrusions, Inc.** Prior to joining Aluminum Extrusions, Wilson was manager of the Wire-Wrap Div. of the Gardner-Denver Co. in Grand Haven, Mich.

Stuart D. Zent has been named national sales manager of automatic washers for the **Norge Div.** of **Borg-Warner Corp.** Zent, who has had more than 13 years experience in the appliance industry, will make his headquarters in the Chicago executive offices of the company.

Martin J. Scully has been appointed field merchandising manager of **Admiral Sales Corp.** He succeeds **Larry L. Malin,** who was promoted to vice president of the commercial electronics division. Appointment of **Bodie L. Stahlschmidt** as general sales manager was also announced.

Hilliard Y. Smuck has been appointed chief executive officer and general manager, and **Thomas M. Zimmerman** has been named executive vice president of **Quaker State Metals Co.** Smuck had been vice president and general manager for sales, and Zimmerman had been vice president of manufacturing.

John P. Fierst has been appointed to the newly created position of field sales manager of **Sharon Steel Corp.** He joined Sharon in 1937.

Rheem Mfg. Co. has announced the appointment of three vice presidents. **Claude E. Modesitt** has been named vice president-operations, **W. E. Schulz, Jr.** becomes vice president-controller in the Automotive Div., and **R. J. Pierson, Jr.** has been appointed vice president-marketing in the Home Products Group.

Henry M. Crossen has been appointed vice president of manufacturing of the **Clearing Div.** of **U. S. Industries, Inc.** He will be responsible for all manufacturing within the division. Crossen joined Clearing in 1959 as director of administration.

Simon Fisher, general manager of **National Electric Welding Machines Co.,** has been elected president succeeding **Edward C. Smith,** who has resigned

S. M. HOPKINS

J. D. HOPKINS

WILSON

ZENT

CROSSEN

FISHER

What Yardstick Do You Use...
when choosing a motor source?
Here's why the great names in industry SPECIFY GI!
EXPERIENCE. With 40 years' experience in designing and manufacturing, GI can assure you of the most efficient motors to meet any requirements. There's no substitute for experience!
DEPENDABILITY. GI motors have been quality-proved in millions of applications the world over. When the reputation of your product is at stake, you can rely on GI!
ECONOMY. GI is a "complete" motor manufacturer. Almost all components, aside from the raw materials, are produced in our own modern plant, permitting maximum economy consistent with quality.
It Makes Sense To Specify GI...
Smooth Power
AC MOTORS
1/1800 H.P. to 1/35 H.P.
Catalog Available On Request
THE GENERAL INDUSTRIES CO.
DEPT. GF • ELYRIA, OHIO

to become board chairman. Fisher joined National Electric in 1935 as a shop electrician.

Robin Products Co. has announced the appointment of **John W. Stoutenburg** to vice president of sales. In his new capacity, he will direct an expanding sales program for Robin fasteners to the appliance and automotive industries.

J. C. Malone has been appointed assistant to the general manager of the **Silicones Div., Union Carbide Corp.** He will work for the general manager on special assignments involving all aspects of the silicones business.

E. P. Cunningham has been appointed senior vice president-director of international operations of **Clearing Div., U. S. Industries, Inc.** He previously served as general sales manager and vice president of domestic sales. Clearing also announced the appointment of **E. J. Baumrucker** as vice president-domestic sales. Before his promotion he served as sales manager.

BAUMRUCKER

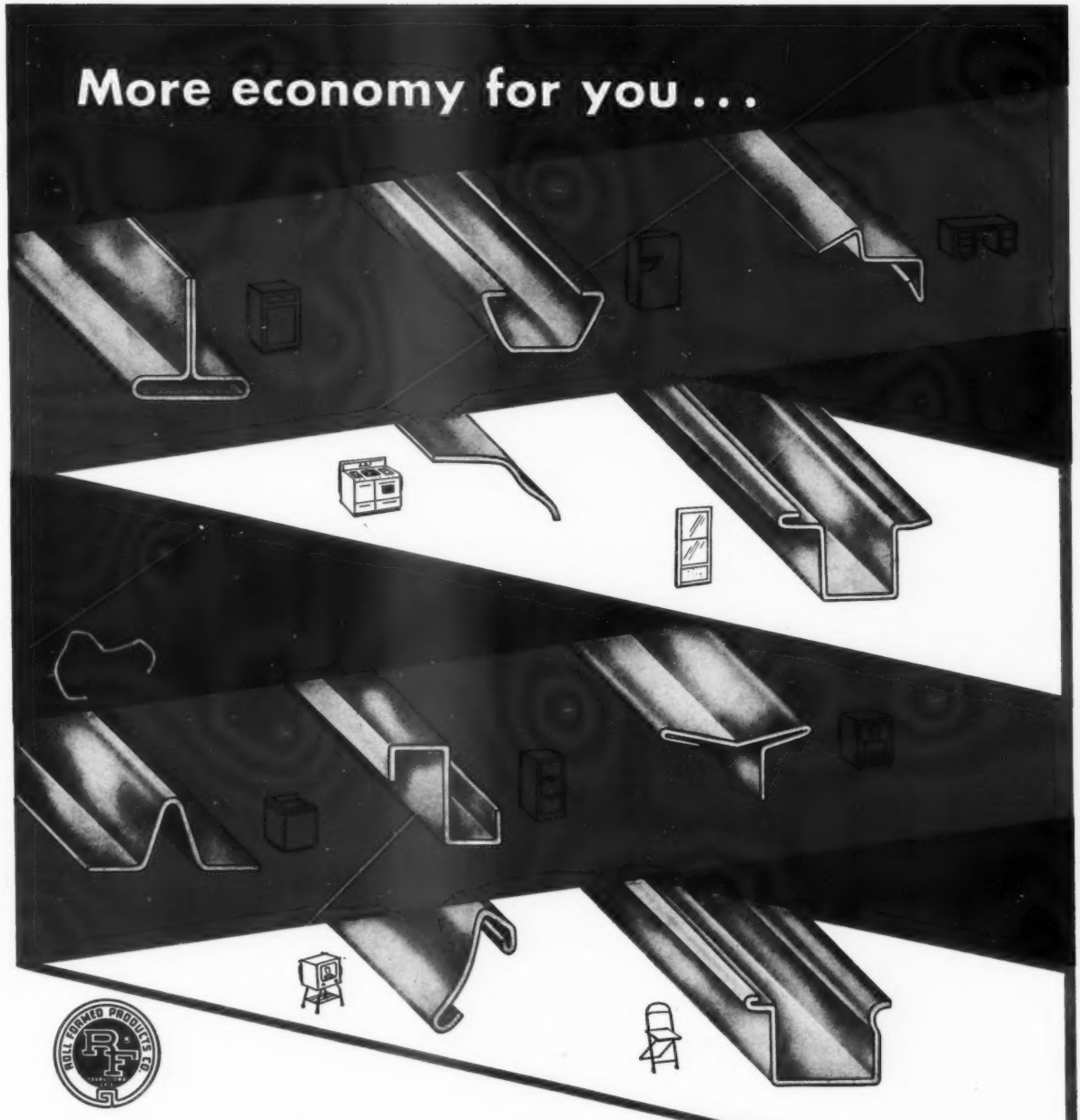
CUNNINGHAM

Robert G. Axtell has been appointed to the newly created position of director of marketing (fabricating operations) for **Cerro de Pasco Corp.** In his new post Axtell will be responsible for coordinating marketing activities of Cerro's five fabricating divisions and subsidiaries in the United States. He will also assist in the development of new products and markets by the fabricating units.

Donald P. Faulhaber of **Robertshaw-Fulton's International Div.** at the firm's headquarters in Richmond, Va., has been appointed an Eastern sales representative for the company's **Grayson Controls Div.**

William A. Klawitter has been appointed supervisor of magnetic and expansion alloys research of **The Carpenter Steel Co.** In his new position he is in charge of a group developing improved alloys for magnetic, glass sealing, and thermal expansion applications.

More economy for you...



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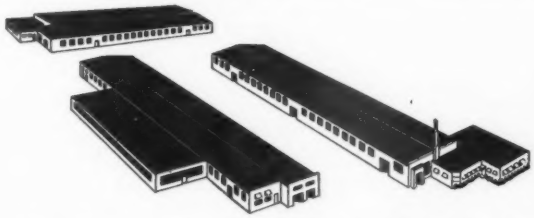
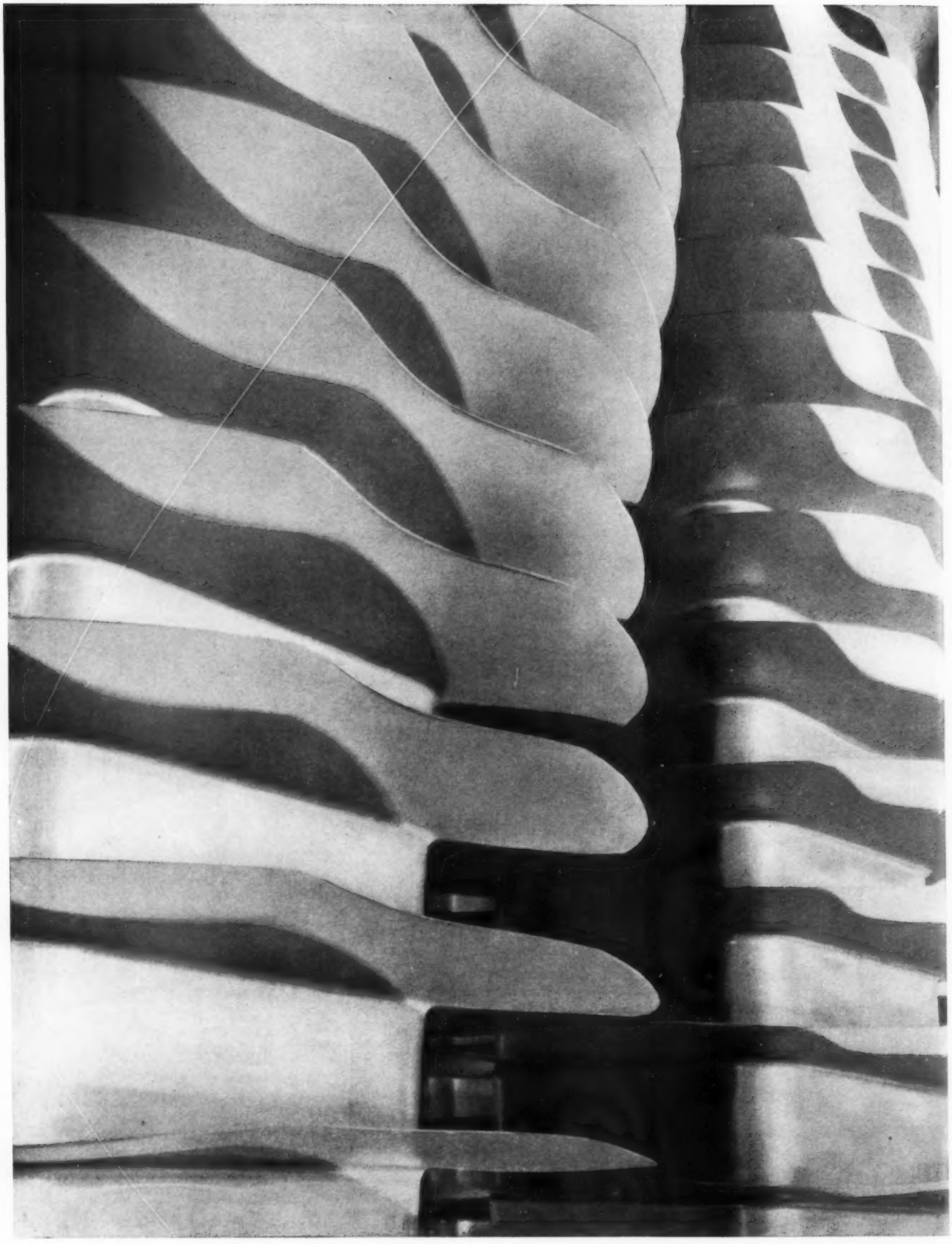
SEE OUR CATALOG IN SWEET'S

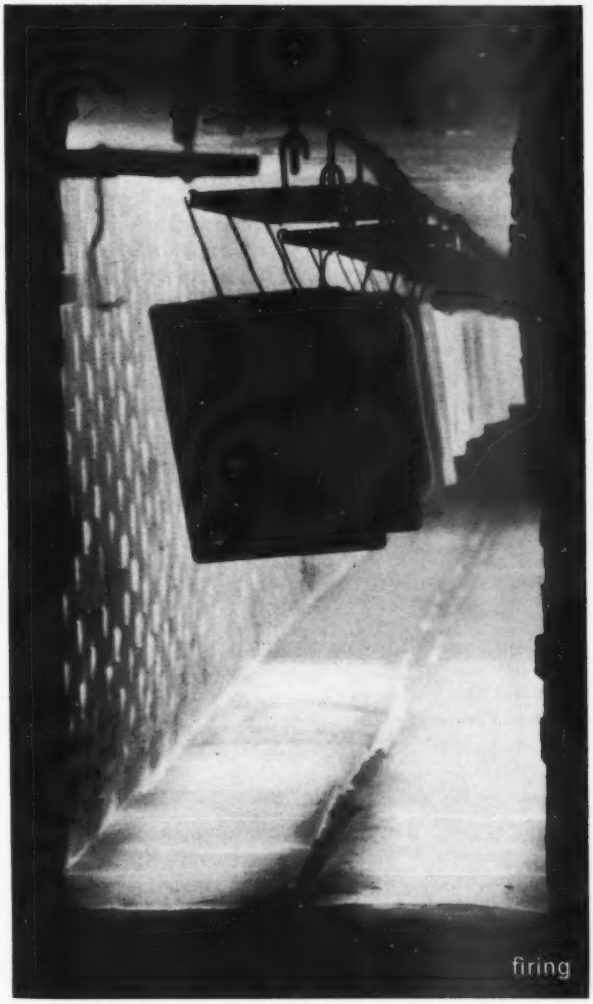


ROLL FORMED PRODUCTS COMPANY

MAIN OFFICE AND PLANT 3758 OAKWOOD AVE. • YOUNGSTOWN, OHIO



stacking the finished product. Note the smooth, even finish on these sinks of USS VITRENAMEL.



Cuts and shapes easily

Sprays and fires smoothly

USS VITRENAMEL Steel

Specify USS VITRENAMEL Steel Sheets if you want your products to have a smooth, hard enamel finish that will take hard wear for years. The finish is on to *stay* because VITRENAMEL is specially treated to fire to a smooth, even, permanent coating. USS VITRENAMEL Steel has a low carbon, low manganese content, so it doesn't warp or sag at high temperatures. It's heat treated for maximum ductility, so fabrication to close tolerances is a cinch. You get fewer rejects due to blisters, fish scales or ugly lines. All these advantages add up to an enameling steel that means a top quality end product and maintains your reputation as a supplier of first line merchandise. Always specify USS VITRENAMEL, available in sheets or coils.

USS and VITRENAMEL are registered trademarks

This mark tells you a product is made of modern, dependable Steel.

United States Steel Corporation—Pittsburgh
Columbia-Geneva Steel—San Francisco
National Tube—Pittsburgh
Tennessee Coal & Iron—Fairfield, Alabama
United States Steel Supply—Steel Service Centers
United States Steel Export Company
United States Steel

How a satisfied customer gets that way

(Continued from Page 29)

How others do it

Reaching outside the appliance industry, AHLMA asked Robert J. Eggert, marketing research manager of the Ford Motor Co., to comment on how automobile manufacturers measure customer satisfaction. Eggert detailed five methods Ford uses to check on the degree of customer satisfaction obtained with Ford owners, including personal interviews, consumer panels, and outside surveys.

Another outsider, M. H. Knapp, assistant vice president, public relations, Illinois Bell Telephone Co., explained how customer satisfaction is built and measured in his business. He pointed out that, strange as it may seem, the telephone company being a monopoly amplifies the problem of customer satisfaction. "The very fact that he can get his telephone only from us intensifies the customer's irritation when he feels he isn't being treated right. Many a complaint has contained the words: "If only you had some competition'."

The publisher's viewpoint was presented by Howard M. Keefe, manager, marketing division, the *Chicago Tribune*. "In researching appliances," he said, "we do not run it through testing labs the way you or Consumers Union might. Instead our laboratory is the consumer. We try to find out what they *think* or *feel* about appliances, not what they know."

He told of a survey of consumers which showed that quality of service (or the dependability of the product) plays an important part in the evaluation of a particular brand.

Touching on appliance servicing of the future, he had this to say: "As appliance servicing moves into the next decade, two things seem quite apparent. One is that your service calls are going to be spread farther and farther away from the core city which will complicate the entire parts and service depot strategy now practiced by most manufacturers. And secondly, your new owners are becoming more the average type of family with little money to spend on costly repairs. For example, in washing machines, the present median income of the owners is $5700, whereas for the future owners it will be only $4800. The shift is toward the middle and lower middle parts of the market as the equipment becomes not luxury but necessity.

Sears' laboratory

The director of Sears, Roebuck & Co.'s Merchandise Development and Testing Laboratory, Thomas Barnes, explained the role the laboratory plays in Sears' "Satisfaction Guaranteed" program and what the responsibilities of cooperating manufacturers and Sears are in carrying out this program.

"The essential function of the laboratory is to help our buyers offer Sears' customers reasonably priced, high-quality merchandise, keyed to today's living."

The laboratory is divided into five groups: industrial design; product development; industrial engineering; industrial packaging; and quality control. The laboratory occupies 75,000 sq. ft. of space in Chicago at the company's headquarters, plus branches in New York City and Ft. Myers Beach, Fla.

After a product is designed and approved for production by an outside manufacturer, Sears has several methods of measuring customers' reactions to current products, Barnes said. These methods include customer use tests; attendance of conferences with free and open interchange of problems; market penetration of the product as a partial indication of consumer acceptance; and reliable feed-back information from the field relative to customer returns, complaints, and free service.

Dividing service costs

Concerning the relationship between Sears and manufacturers on dividing service costs, Barnes said: "Sears believes that a manufacturer should reimburse for labor expended in correction of mechanical or electrical failure. Labor expended in the correction of product failure in the field within the normal guarantee period should be reimbursed by the manufacturer. However, caution must be exercised here, as service history has clearly shown that there is a point below which the factory cannot be expected to go in providing a high-quality product, using mass-production techniques."

A survey-card system for measuring customer satisfaction with appliance service calls was explained by Robert E. Myers, general service manager of Philco Distributors, Inc., Los Angeles.

Cards are sent to customers following a service call, and the customer is asked to make a rating of "excellent," "good" or "poor" on five points: promptness, attitude of servicemen; neatness of work; appearance of servicemen; and office telephone courtesy.

"This instrument, or card, places each and every call under the most critical supervision of the American housewives. The grade on each card becomes part of the service agency that performed the service for the consumer."

Another Maytag representative, A. B. Murray, spoke at the morning session and gave a report on a survey on "product improvement" conducted through AHLMA.

Murray reports on survey

Murray, manager of product and market planning, said questionnaires were designed to supply information that would make possible a report on industry-wide improvement of product.

Among the important questions asked defective parts and a comparison of these costs over the past five years. "When comparing the weighted average of automatic washers," Murray reported, "the replacement cost per machine was 32 percent higher in 1959 than in 1955. Electric dryers decreased 28 percent and gas dryers 38 percent. Wringer washers decreased 1.4 percent." He hastened to add that a number of changes in automatic washers, including automatic water level control, automatic dispensing devices, simplified controls, and general improved performances, often require more complicated mechanisms.

"The maintenance of the additional features added to automatic washers over the past five years can make a comparison between the replacement costs of parts in 1959 to those in 1955 somewhat unrealistic. An evaluation of the development of automatic washers over the past five years reveals that additional services have widened the use of and the satisfaction gained from the use of the product."

In summarizing his report, Murray said, "Warranty costs have followed the cycle of added features and more complete automaticity. There is evidence that within the last two years manufacturers have consolidated their gains and refined their designs; consequently, there has been a reduction in warranty costs — indicating improved quality. Positive progress has been made in simplifying the servicing of laundry products along with a reduction of service potential." —MPM

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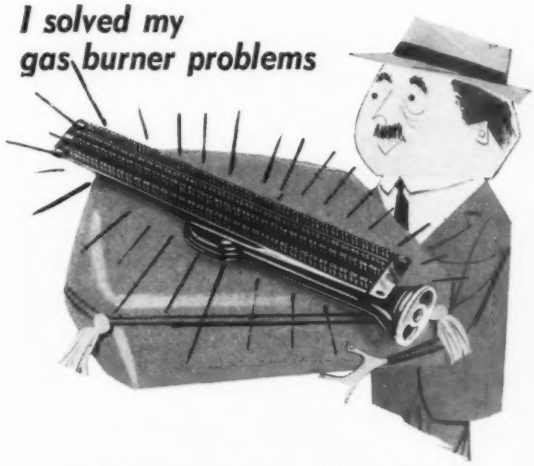
In an effort to improve service and speed delivery of mail, the Post Office Department asks that you always include your postal zone number in your address.

We wish to cooperate in every way we can — but we need your help. By giving us your zone number, you'll assure yourself of speedy delivery of your magazines.

Help yourself to better service. USE YOUR POSTAL ZONE NUMBER — on all your correspondence!

METAL PRODUCTS MANUFACTURING

I solved my gas burner problems



– with patented stamped steel porcelain enameled burners

- No drilling or tapping necessary
- Porcelain enamel finish
- Smooth, non-resistant interior
- Light weight
- Ready to install
- Raised 5/8 inch ports
- Ideal for commercial, industrial, and domestic heating appliances, water heaters and laundry dryers.

For Information Write or Phone

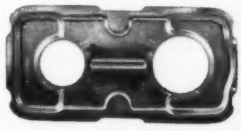
SAMUEL STAMPING & ENAMELING CO.

Burner Division — Chattanooga, Tennessee

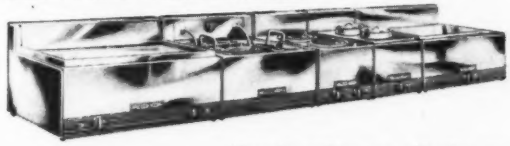
Mass Produce These Parts On Your Production Line

Just form, package and ship any of the items shown . . . and countless more. They're fast, easy and economical to fabricate from APOLLO Pre-Finished Metals. Use the same equipment as for ordinary sheet metal.

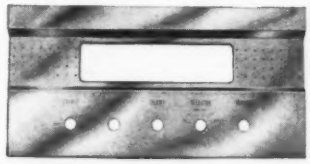
Attractive hardware items in unlimited variety are being manufactured more economically and faster from APOLLO Pre-Finished Brass and Bronze. Available pre-polished and pre-enameled, or pre-finished with bright or satin chrome – the uniform beauty of these parts cannot be equalled by costly piece finishing.



Aerator pans, oven and rotisserie linings, back rail trim, stove doors and tops and broiler pans can be mass produced at less cost when made from APOLLO satin or bright finished tarnish-resistant ChromSteel.

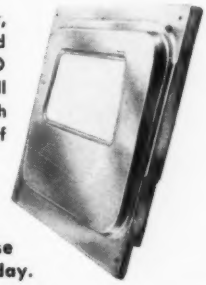


There's nothing as effective as gleaming APOLLO Pre-Finished ChromSteel to simplify production of all types of food service equipment. Sturdy, tarnish-resistant, easy to work, weldable, APOLLO ChromSteel permits a finer job at a fraction of the cost of piece finishing, while greatly increasing production.



APOLLO Satin-Finished BrasSteel is ideal for radio, Hi-Fi and TV cabinet trim, control panels and hardware. Pre-finished surface allows embossing, patterning and silk-screening operations to be performed before forming...cuts costs...saves time.

Deep draws, such as in this oven door, are no problem when fabricated from Specification Plate on APOLLO ChromSteel. Severe stretching will not draw out the characteristic finish or lessen the corrosion resistance of satin finishes.



Get the facts on how you can eliminate time-consuming shop operations, simplify and increase production. Contact APOLLO today.

Apollo METAL WORKS

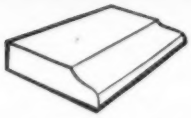
6684 S. OAK PARK AVENUE • CHICAGO 38, ILLINOIS

(Inland "job-tailored" Cold Rolled Sheets)

SURFACE

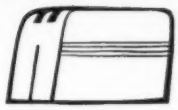
In a dancer, this is a visual quality. In Inland Cold Rolled Sheets, characteristics of surface are far more complex—"tailor-made" for your specific manufacturing operation, plant equipment, and for the function of your end product.

For example, the sheet surface for the fabrication of an automotive floor pan must hold enough die lubricant to permit the draw to be made speedily and efficiently. In electrostatic painting, a too-rough surface may raise costs by holding an excess of paint. A too-smooth surface may create its own problems. For plating, painting, improved die practice, for a host of manufacturing techniques, different surfaces are often required, *and for each—Inland supplies the exactly-right Cold Rolled Sheet!*



Inland Cold Rolled Sheets assure oven hoods a smooth surface that finishes to a lustrous gleam—give a competitive edge so necessary in today's market.

Steel office furniture units made of Inland Cold Rolled Sheets have smooth surfaces, and the attractive utility that helps clerical efficiency.



Because toaster shells require an excellent surface for chrome plating, it's only natural so many are made of Inland Cold Rolled Sheets.

INLAND

INLAND STEEL

30 West Monroe St., Chicago 3, Ill.

Sales Offices: Chicago • Davenport • Detroit • Houston • Indianapolis • Kansas City • Milwaukee • New York • St. Louis • St. Paul

PEI sets marketing goal

→ *from Page 40*

dustrialized building. He stated that research, leading to real innovation, is quite important. Leadership, cooperation and innovation should come from within the building industry; if not, it will certainly come from without. Waste in materials and building practices must, in Koch's opinion, be minimized. The speaker referred to architecture today as an assembly of pre-manufactured products.

In speaking specifically to the porcelain enamelers, Koch said, "Standardization of components on which porcelain enamel is applied is more important than refinements in the material."

Another direct statement to the porcelain enameling industry which has been voiced many times, but not often from the speaker's stand, was to the effect that the industry will *never find an extensive market in housing as long as the work is handled on a job basis.*

In a cleverly illustrated presentation, William Mitchell of General Motors traced design trends, showed how modern products can be carefully designed to meet the public's requirements and desires, and demonstrated the effect of good design on sales and merchandising.

Change is essential to selling, Mitchell said. "The designer brings man change and, ideally, change for the better. He gives alluring identity to the things he deals with. The function of the designer is to make sure that all elements of a product are adapted to one another. But the designer must never lose sight of the fact that seeing is selling," Mitchell said. "He must keep elements of management aware that the way the product looks will have as much to do with its saleability as any other single factor. The designer in charge is as important a part of the business as the vice president in charge of manufacturing, the sales manager, and the advertising director.

"The designer today," Mitchell continued, "is effective only as he understands and makes others understand the need for constant change. Then he must make sure that the change is progressive and improving and harmonious. The bizarre — the off beat — is no substitute for good design at any time."

Back-up products needed

John C. Harkness, in his talk before the enamelers, stressed the importance of research and development having "back-up items" in readiness for merchandising at the appropriate time.

According to the speaker, Bell & Howell does 80 percent of its product sales volume on products that were not in the picture five years ago, and 95 percent of its sales volume on products that were not in existence ten years ago.

Harkness voiced a note of warning, however, in stating that there is always constant pressure on R & D by sales and top management people to put products on the market and, as a result, many times they are sent to market before they are sound or ready for sale to the consumer.

The refrigerator — greatest value in durable goods market

There is little doubt in the mind of Carroll McMullin that there is a serious challenge in the changing retail market for durable goods. "Certainly our markets," said McMullin, "for whatever products we are handling, are getting bigger and bigger." This takes into consideration population growth, the soaring birth rate, and can prove a never-ending nightmare for sales managers in establishing market quotas.

This speaker pointed out, however, that with increased potential demand for all products, we find the products themselves multiplying — as well as getting better and better.

McMullin made a point similar to that of Harkness, in referring to a claim that has been made that 80 percent of the appliances and electronics being sold today were not even on the market 20 years ago. This trend is expected to continue at an accelerated rate.

McMullin stressed the point that has been expressed by many who are interested in appliances, and that is the steadily increasing value offered to the buyer for *less money*. A short ten years ago, he said, a ten-inch television set sold to the public for $389.95. Today we offer a 21-inch television at a list price of $189.95 — "and who pays list prices any more for a television set?" I will say to you today," he said, "*that the refrigerator at its present depressed price represents the greatest value in the durable goods industry.*

He estimated that 50 percent of the refrigerators in use are obsolete with respect to current major features.

As a comparison, if the Consumer Price Index of 1947-49 is used as representing 100 percent, the record shows that the prices of new cars are up to 134 percent; new tires up to 35 percent; while ranges are down 102 percent; washers down 98 percent; and refrigerators down 64 percent."

With the appliance-television industry geared to take care of any reasonable consumer demand, McMullin decried the "market forecasting game" played each

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JOHN C. HARKNESS . . .
R & D must have "back-up items" in readiness

C. D. McMULLIN . . .
the biggest appliance competitor in not a rival firm

MPM PHOTOS

P. M. CORP . . .
the program chairman presents his stars

METAL PRODUCTS STATISTICS

		1960 (Units)	1959 (Units)	% Change
Gas Furnaces	August	96,200	115,200	-16.5
	Jan.-Aug.	566,000	648,000	-12.7
Gas Boilers	August	16,987	18,162	- 6.5
	Jan.-Aug.	87,112	88,302	- 1.3
Gas Conversion Burners	August	16,800	20,200	-16.8
	Jan.-Aug.	75,100	81,600	- 8.0
Oil Fired Central Heating Equipment	July	40,411	49,299	-18.0
	Jan.-July	268,118	298,573	- 4.2
Gas Ranges, Free-Standing	August	120,200	143,300	-16.1
	Jan.-Aug.	967,400	1,069,200	- 9.5
Gas Ranges, Built-In	August	31,700	32,800	- 3.4
	Jan.-Aug.	229,000	220,200	+ 4.0
Gas Water Heaters	August	279,400	256,100	+ 9.1
	Jan.-Aug.	1,891,300	2,043,600	- 7.5
Gas Vented Recessed Wall Heaters	August	33,500	40,800	-17.9
	Jan.-Aug.	222,500	273,300	-18.6
Gas Floor Furnaces	August	10,800	9,800	+10.2
	Jan.-Aug.	46,800	54,400	-14.0
Gas Direct Heating Equipment	August	160,100	196,500	-18.5
	Jan.-Aug.	714,300	789,800	- 9.6
Gas Unit Heaters & Duct Furnaces	August	13,200	14,400	- 8.3
	Jan.-Aug.	96,500	90,200	+ 7.0
Gas Incinerators	August	3,900	4,100	- 4.9
	Jan.-Aug.	29,200	27,900	+ 4.7
Electric Household Refrigerators	August	301,400	314,100	- 4.3
	Jan.-Aug.	2,370,600	2,551,200	- 7.8
Electric Farm & Home Freezers	August	112,200	108,400	+ 3.5
	Jan.-Aug.	784,000	886,000	-11.5
Electric Ranges, Free-Standing	August	65,900	61,300	+ 7.5
	Jan.-Aug.	558,300	624,000	-10.0
Electric Ranges, Built-In	August	56,500	55,300	+ 2.1
	Jan.-Aug.	450,100	470,700	- 4.3
Electric Water Heaters	August	42,700	60,000	-29.0
	Jan.-Aug.	449,700	567,400	-20.8
Electric Dishwashers	August	52,300	43,900	+12.3
	Jan.-Aug.	364,000	318,800	+14.2
Electric Food Waste Disposers	August	66,200	62,500	+ 5.9
	Jan.-Aug.	482,400	476,400	+ 1.2
Combination Washer-Dryers	August	12,237	18,179	-33.0
	Jan.-Aug.	101,071	115,093	-12.0
Washers—Automatic & Semi	August	230,540	270,332	-15.0
	Jan.-Aug.	1,634,000	1,891,871	-14.0
Washers—Wringer & All Other	August	65,959	89,517	-26.0
	Jan.-Aug.	482,860	596,226	-19.0
Electric Dryers	August	69,658	87,291	-20.0
	Jan.-Aug.	432,250	493,892	-12.0
Gas Dryers	August	35,461	45,906	-23.0
	Jan.-Aug.	228,046	241,974	- 6.0
Vacuum Cleaners	August	280,575	268,465	+ 4.5
	Jan.-Aug.	2,186,051	2,220,887	- 0.7
Metal Furniture	Jan.-Aug.	*	*	- 6.0
†Television	July	283,475	*	*
	Jan.-July	3,491,336	3,334,540	+ 4.5
†Radio (1)	July	890,359	*	*
	Jan.-July	9,414,879	7,936,621	-15.6
Typewriters	August	99,904	*	*
	Jan.-Aug.	738,869	*	*(a)
Compressor Bodies (2)	Jan.-Dec.		4,926,657	+37.0
Steel Barrels & Drums	July	2,549,388	2,856,915	-10.8
	Jan.-July	17,806,069	21,267,630	-16.2
Room Air Conditioners	August	75,000	*	*
	Jan.-Aug.	1,305,500	*	*
Unitary Air Conditioners (3)	Jan.-June	185,474	*	+15.0
Heat Pumps	Jan.-June	19,845	*	+25.0

(1) Including auto receivers (2) Except for household refrigerators
(3) Including heat pumps (a) Increase over 1958
* Not reported † Output — all other figures are factory shipments or factory sales

Sources for this information: Gas Appliance Manufacturers Association, National Electrical Manufacturers Association, American Home Laundry Manufacturers Association, Vacuum Cleaner Manufacturers Association, National Association of Furniture Manufacturers, Electronic Industries Association, Air-Conditioning and Refrigeration Institute, and U.S. Dept. of Commerce.

Industry news

→ *from Page 80*

pivoting ram. For plate from ¼-inch thick and up, the machine square shears and bevels in a single motion of the ram, as, first, the square shearing knife, then the beveling knife, pass through the metal. The ram, containing the two cutting blades, pivots around one fulcrum during square shearing, then another during beveling. The bevel cut, therefore, is actually an extension of the same downward motion of the ram which made the square cut.

Fasson Doubles Plant Capacity

A block-long coating and laminating machine, said to be capable of applying coatings and backing paper to a virtually unlimited variety of materials — papers, films, foils and acetates — which are converted to self-adhesive signs, decorative trim and other graphic arts and industrial products is now in operation at Fasson Products, a division of Avery Adhesive Products, Inc.

Installed in a new 18,000-sq.-ft. extension to the plant area, as part of Fasson's 1960 expansion program, the machine is rated at what is said to be the

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PEI sets marketing goal

→ *from Page 93*

year by sales managers and top management among the appliance-television manufacturers. "I believe," said McMullin, "that the industries could strengthen their position considerably if they would sell the public on the advantages of their product instead of selling why you should buy Brand X instead of Brand Z. In the appliance-television industry our biggest competitor is not a rival firm, but other industries such as boating, travel, entertainment, whiskey, etc."

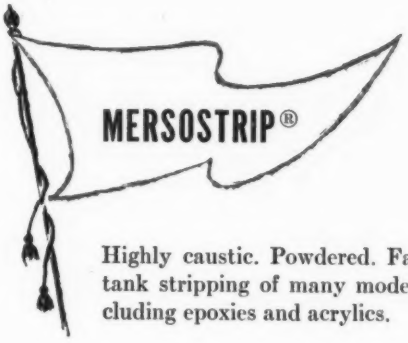
As might be expected, this speaker touched on service before closing his message. "We are going," he said, "to have to make great strides in attracting a good caliber of man to the service end of our business and give him plenty of proper training — both in fixing the product and in human relations."

Promotion program continued

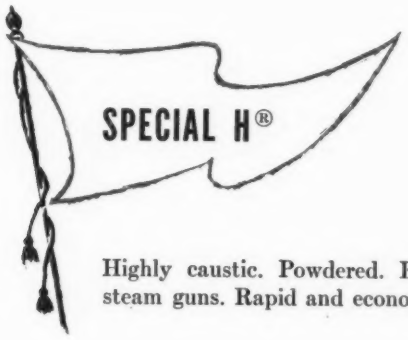
President Winget, in his remarks to the convention, announced that the PEI-sponsored promotional activities launched in 1960 would be continued during 1961. He announced that support of the 1961 program had reached the $80,000 mark at the time of the annual meeting.

We've got what you want in paint strippers

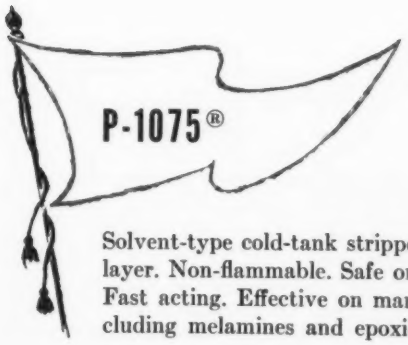
Paint is tenacious stuff, and it's getting more so . . .which is good. But what about the problem of taking off the modern finishes so well-made by paint formulators to stay on? No problem. Even epoxies, acrylics, and melamines yield to these specialized strippers from Wyandotte!



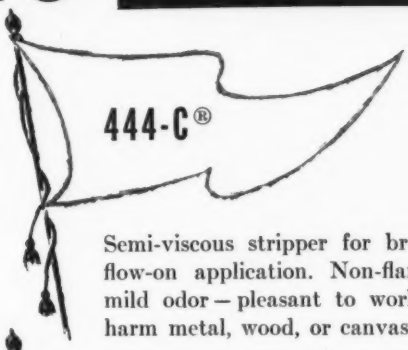
Highly caustic. Powdered. Fast acting. For tank stripping of many modern finishes, including epoxies and acrylics.



Highly caustic. Powdered. For tanks and steam guns. Rapid and economical.



Solvent-type cold-tank stripper with sealing layer. Non-flammable. Safe on most metals. Fast acting. Effective on many finishes, including melamines and epoxies.



Semi-viscous stripper for brush, spray, or flow-on application. Non-flammable. Very mild odor — pleasant to work with. Won't harm metal, wood, or canvas.

Semi-viscous stripper for brush and spray application. New activator removes many difficult paints. Leaves metal unharmed. Rinses easily, facilitating repainting.

For data, or a demonstration, or both — call your Wyandotte representative, or mail coupon. *Wyandotte Chemicals Corporation, Wyandotte, Mich. Also Los Nietos, Calif.; and Atlanta, Ga. Offices in principal cities.*

Wyandotte® Chemicals J. B. FORD DIVISION

The best in chemical products for metal finishing

Wyandotte Chemicals Corp., Dept. 3268, Wyandotte, Mich.

☐ Please send me further data on

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☐ Please have your representative call

Name_____

Title_____

Company_____

Address_____

City_____ Zone____ State_____

4 YEAR SUCCESS STORY!

Here's What the Tyler, Texas Plant of General Electric reports:

"Damage claims are no longer a headache to management. We have used a Chicago Mill designed box for our air conditioners now for four years and have reduced a major customer complaint to an absolute minimum.

This has been one of our more successful cost reductions in the past few years."

GENERAL ELECTRIC

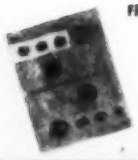
COMPANY

Air Conditioning Dept. Tyler, Texas

A. Allen, *Purchasing Agent*

Why Not Cut Down Damage Claims by Shipping in CHICAGO MILL Containers?

LARGE OR SMALL — CHICAGO MILL MAKES 'EM ALL!
A COMPLETE LINE OF CONTAINERS FOR EVERY SHIPPING PURPOSE!



FREE! Illustrated Catalog Describing Chicago Mill's Shipping Containers and Services!

PALLET BOXES — Wire Bound

PALLET BOXES — Hinged Corner

Cleated Boxes

E-Z Pak Cleated Corrugated (Watkins type)

Wirebound Crates

Wirebound Boxes

Corrugated

Hinged Corner Crates or Boxes

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- HELENA, ARKANSAS
- ROCKMART, GEORGIA
- TALLULAH, LOUISIANA

safe transit

editorial voice of the national safe transit program

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DANA CHASE PUBLICATIONS, INC.

Devoted to improving packaging shipping, and materials handling methods for the appliance and metal products manufacturing industries. This section contains information on plant experience and industry advances for improving packaging and shipping methods, and prevention of in-transit loss. It also contains information on the National Safe Transit Committee's preshipmet testing program and reports on NST activities.

Unlimited Take-Up Heavy Duty Tensioner

The Signode Model TH Tensioner is said to be a fast, manual action strapping tool, with self-energized feed wheel that holds high tension. It takes strapping directly from the coil and saves a

foot or more of strap every time it is used. Any type seal can be used, and the seals can be placed either in front or behind the tensioner. The unit takes strap sizes from ¾ inch by .028 inch to 1¼ inch by .050 inch, waxed, painted or coated.

Write Signode Steel Strapping Co., 2600 N. Western Ave., Chicago 47, Ill.

"All manufacturing, engineering, and quality efforts are in vain if the product reaches its destination in a damaged condition."

Combs Appointed Chairman

Ted C. Combs, vice president of engineering, Zero Mfg. Co., has recently been appointed chairman of the Container Design Section, Packaging & Handling Div., American Ordnance Association. The section will analyze types and special designs of military containers for complex weapons systems and components, and serve as liaison between the military and industry. His firm specializes in manufacturing containers for the electronics industry and the military.

Brochure on National Safe Transit Tests

A 4-page brochure on the National Safe Transit Committee's tests and their application to corrugated shipping containers has been prepared by Gaylord Container Div., Crown Zellerbach Corp., 111 N. Fourth St., St. Louis 2, Mo.

This brochure describes the tests and briefly outlines advantages to shippers.

International Paper Names Manager

Edward G. Hewitt, formerly sales manager of the International Paper Co., Container Div. plant at Wooster, Ohio, has been named manager of that operation, it was announced recently by Arthur B. Damon, divisional general manager. Hewitt joined International Paper Co. in 1948, and will continue to make his headquarters in Wooster. He succeeds Robert D. Jollay, who has been named district sales manager of the company's Ohio Valley container operation.

Bulletin on Rapistan Flow Rack

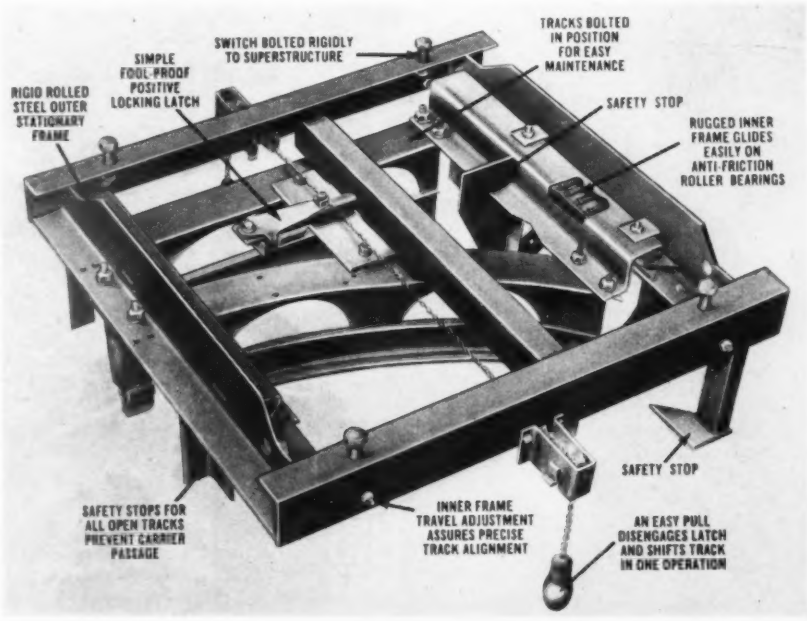
Photographs, drawing and diagrams are liberally used to explain principles, operation and installations of Rapistan Flow Rack for live storage in a new 8-page, 2-color bulletin offered by The Rapids-Standard Co., Inc., Grand Rapids, Mich., manufacturer of materials handling equipment.

For a copy of the bulletin, write The Rapids-Standard Co.

Roller-Gliding Overhead Track Switches

Two new overhead track switches, designated as Types K and L and designed for loads of 2000 lbs. to 4000 lbs. capacity respectively, have been announced by the Cleveland Tramrail Div., The Cleveland Crane & Engineering Co., Wickliffe, Ohio. Said to be of rugged construction, they are assembled in jigs to assure accuracy and permanency of alignment. This construction minimizes failures due to repeated shock loads, vibration, and twisting strains which are normal for most installations.

Types K and L switches are made for left-hand, right-hand, and three-way operation; for manually-operated and motor-propelled systems. Switches may be shifted by hand, electric or air power.


TRACKS BOLTED IN POSITION FOR EASY MAINTENANCE
SWITCH BOLTED RIGIDLY TO SUPERSTRUCTURE
SIMPLE FOOL-PROOF POSITIVE LOCKING LATCH
RIGID ROLLED STEEL OUTER STATIONARY FRAME
SAFETY STOP
RUGGED INNER FRAME GLIDES EASILY ON ANTI-FRICTION ROLLER BEARINGS
SAFETY STOP
SAFETY STOPS FOR ALL OPEN TRACKS PREVENT CARRIER PASSAGE
INNER FRAME TRAVEL ADJUSTMENT ASSURES PRECISE TRACK ALIGNMENT
AN EASY PULL DISENGAGES LATCH AND SHIFTS TRACK IN ONE OPERATION

How container manufacturers are telling the NST story

company publications give big push to pre-shipment testing program

PROOF IN "BLACK AND WHITE" of the increasing stature of the National Safe Transit Committee has come forth in the past few months.

Two leading container manufacturers — Gaylord Container Div., Crown Zellerbach Corp., and Hinde & Dauch Div., West Virginia Pulp and Paper — have published excellent material on the whys-and-wherefores of pre-shipment testing.

Since its inception in 1948, the NSTC program has gained increasing respect among manufacturers of mass-produced items, carriers, and container producers. The endorsement of pre-shipment testing through the Gaylord and Hinde & Dauch publications adds support to the NSTC "cause" and is tangible evidence of its growing status in the industry.

Gaylord's contribution

The Gaylord brochure, four-pages, two-colors, is titled "Gaylord Uses This Machine to Drop Your Packaged Product," and shows on its cover a typical drop test for a corrugated container. Other illustrations depict impact and vibration testing.

Copy in the brochure explains how Gaylord maintains an NSTC-certified laboratory for pre-shipment testing of its customer's packaged products. Benefits of displaying the NSTC seal on shipping containers are boldly spelled out: "This seal tells the world you ship first-class... when he [the carrier] sees this [NSTC seal], the carrier knows that you, too, are trying to cut damage claims. He handles your shipment accordingly.

"The seal assures the distributor that he will receive fewer damaged packages and fewer customer complaints. He'll keep your product moving. The seal tells your customer that you have done everything possible to control the quality of your product, from design to delivery. This makes him happy — and there is almost nothing as nice as a happy customer."

The case for NSTC is further strengthened with a brief message on the back page of the Gaylord brochure: "We are proud to be associated with the National Safe Transit Committee as a certified test laboratory. We feel that the committee's establishment and maintenance of specific testing standards for packaged products is a significant contribution to every industry concerned with the safe transportation of your packaged product."

Hinde & Dauch

The educational effort of Hinde & Dauch is wrapped up in the summer issue of *Package Laboratory News*, described on the cover as a special issue on pre-shipment testing.

The 16-page, attractively designed issue contains an analysis of the cost of in-transit damage, an explanation of the standard pre-shipment tests, and comments by executives from the three major modes of transportation, from the

Covers of container manufacturers' publications feature NSTC-approved compression and drop tests.

academic field, plus an article on the origin and purpose of NSTC by MPM Editor-Publisher Dana Chase.

Under the heading, "Billion Dollar Question," the introductory article details annual cost of shipping loss and damage. Figuring the railroads' annual claims at $115 million, another $50 million for truckers and airlines, and adding the millions of dollars it costs carriers and receivers to file and process claims, Hinde & Dauch estimates that the annual cost approaches the billion dollar mark.

Next, four standard pre-shipment container tests — compression, vibration, impact and drop — are explained and illustrated. "These carefully conducted experiments," the copy reads, "detect over-packing as well as under-packing, and reveal the characteristics a box must have to protect the product."

The following page describes two additional tests H & D runs on its corrugated containers: the Mullen test, which checks burst resistance of the box; and the puncture test, which calibrates the resistance of corrugated material to impact from sharp objects.

Under the "Carrier Comment" section of the issue, shipping hints are offered by three authorities: C. A. Naffziger, director, freight loss and damage prevention section, Association of American Railroads; Reginald C. G. Witt, acting executive secretary, National Freight Claim Council of American Trucking Associations, Inc.; and C. B. Newman, director, passenger and freight service, Air Transport Association of America.

"A Pre-Shipment Testing Program That Works!" is the title of Dana Chase's contribution to H & D's coverage of the NSTC program.

"The idea for a voluntary, cooperative program for the reduction of in-transit losses," he writes, "had its inception in the offices of a Chicago trade publication [MPM] serving the home appliance industry. It came as recognition of the fact that millions of dollars were being lost annually through in-transit damage to mass-produced appliances and similar products which were greatly needed to fill the demand of the end user.

"It was readily recognized that the basic problem was far too broad and important to be handled by an editorial program alone, so arrangements were made with a national trade association to coordinate a voluntary, cooperative program, and leading manufacturers were prevailed upon to furnish experienced key personnel for the establishment of a program.

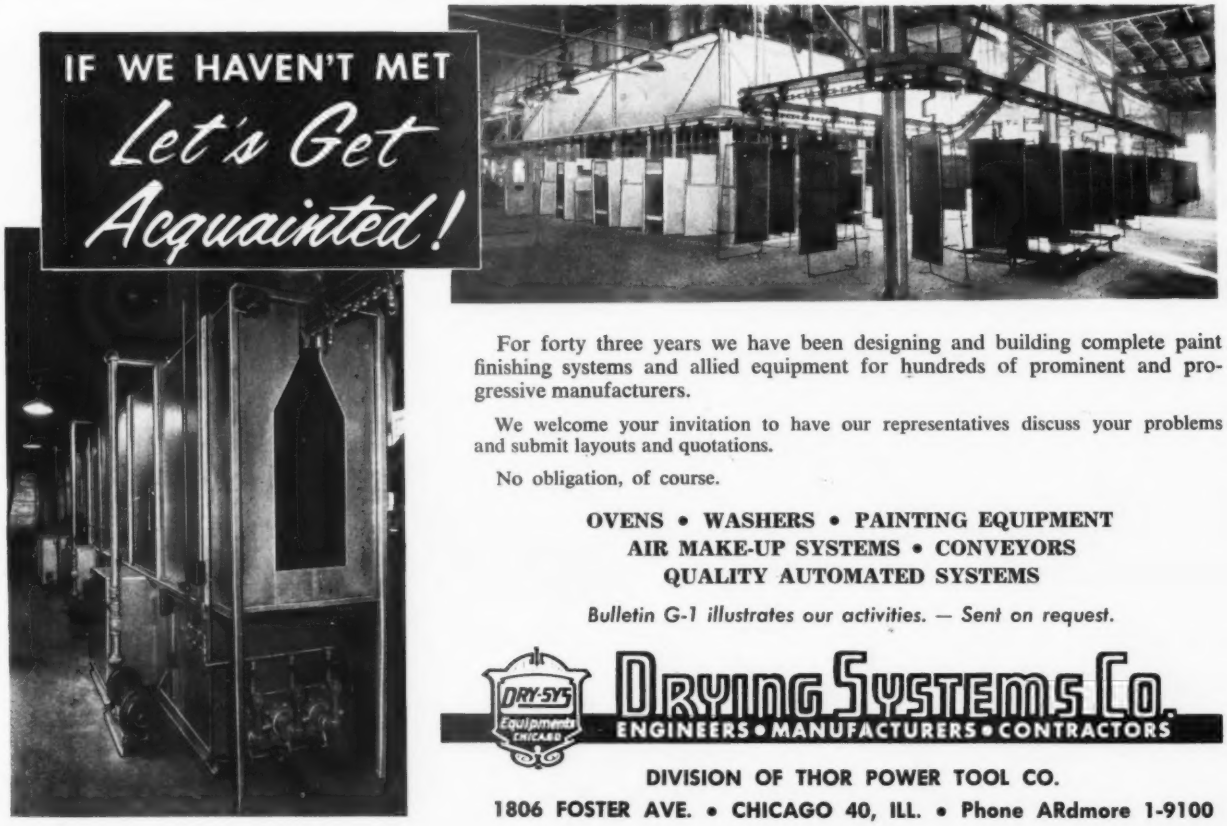
"The result, after 12 years of cooperative effort, is the first standard pre-shipment test procedure to get national recognition by both the manufacturers of mass-produced units and all leading carrier organizations. The NSTC test procedures now form a part of many important government specifications."

The balance of the article deals with the specifics of what the NSTC program can and cannot do, and spells out the following advantages of the program to the end product manufacturer: reduced product damage in transit; reduced packaging costs; better quality control; a tool for design engineering; improved carrier, distributor and dealer relations; and a vital sales aid.

The issue is rounded out with an article by James W. Goff, associate professor, School of Packaging, Michigan State University.

Professor Goff's article explores the beginning of package testing (first recorded test at Purdue University in 1905), the objectives of the testing, and touches on experimental work to improve packaging and testing methods.

MPM recognizes that other container manufacturers are contributing to the NSTC educational effort. We welcome literature of this nature for possible editorial consideration. —MPM



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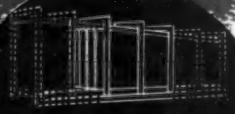
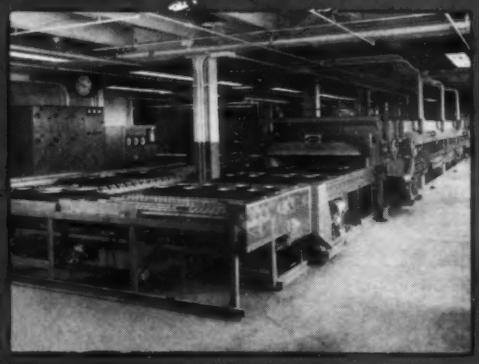
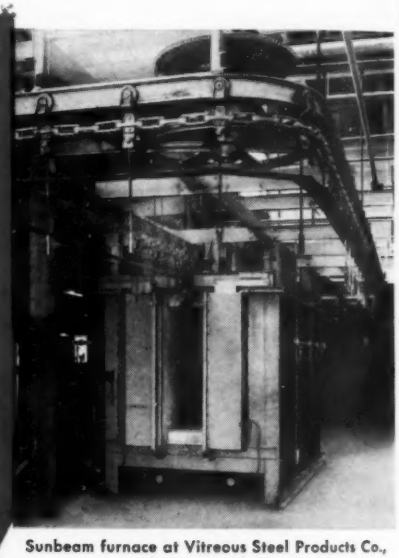
FURNACES THAT CAN BE EXPANDED TO MEET INCREASED PRODUCTION NEEDS



FURNACES THAT CAN BE CONVERTED FROM INTERMITTENT TO CONTINUOUS



Sunbeam furnace at Textile Machine Works, Reading, Pa.



Sunbeam furnace at Vitreous Steel Products Co., Nappanee, Ind.

FURNACES THAT GIVE YOU PRICE AND OPERATION ADVANTAGES

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A Division of The Eagle-Picher Company

1425 S. 55th Court, Cicero 50, Illinois

Exclusive Representatives to the Porcelain Enamel Industry for Sunbeam Furnaces.

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No matter what you need... in PORCELAIN ENAMELING SUPPLIES and EQUIPMENT Chicago Vit can supply it!

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Wheelabrator Blast No. 2 table with 8 – 27¼" multitables electric motors and controls, complete with dust collector. Ideal for deflashing ceramics, plastics, porcelain enameling. Equipment priced to sell. **M. Elstein, 426 Grand St., Jersey City 2, N. J.**

Chicago press makers

→ *from Page 67*

Another outstanding press was a cold extrusion model equipped with a double transfer feed mechanism. The press feeds slugs from a single hopper to two Transmat mechanisms. In parallel transfer operations, the material is moved to each station by mechanical fingers. Starting with a pre-coated slug the material is checked for size in the first station and extruded at the second station. The third station performs draw-wipe and pierce, and a finished wrist pin is unloaded through the bottom of the die.

Industry news

→ *from Page 94*

highest production capacity for a single device in the nation. It coats a maximum-size web of 56 inches at speeds in excess of 200 feet per minute.

TV Sales Force Realigned

In a move to concentrate major effort on serving its distributor organization, General Electric's television receiver department in Syracuse, N. Y., has realigned its field sales force. As a result, the department has doubled its national sales districts and will increase to 12 the number of its district sales representatives.

Chemical Plant Expanded

The J. C. Miller Div. of Hanson-Van Winkle-Munning Co. has announced the completed expansion of the H-VW-M manufacturing facility in Grand Rapids, Mich. By the addition of reactors, filtration equipment and mixing equipment, the company has tripled the monthly production capacity of the plant.

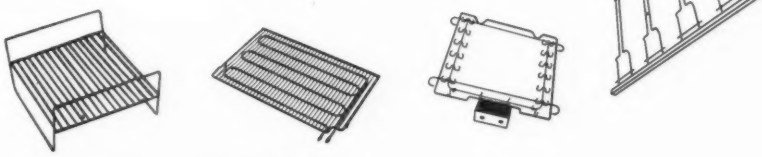
WIRE WONDERLAND . . . .

HOME OF THE ONE DEPENDABLE SOURCE FOR ALL WELDED WIRE APPLIANCE COMPONENTS

For almost 60 years, Union Steel Products Company has earned and maintained a position of leadership in the design, development, manufacture and finish of welded wire components for *all* appliance applications.

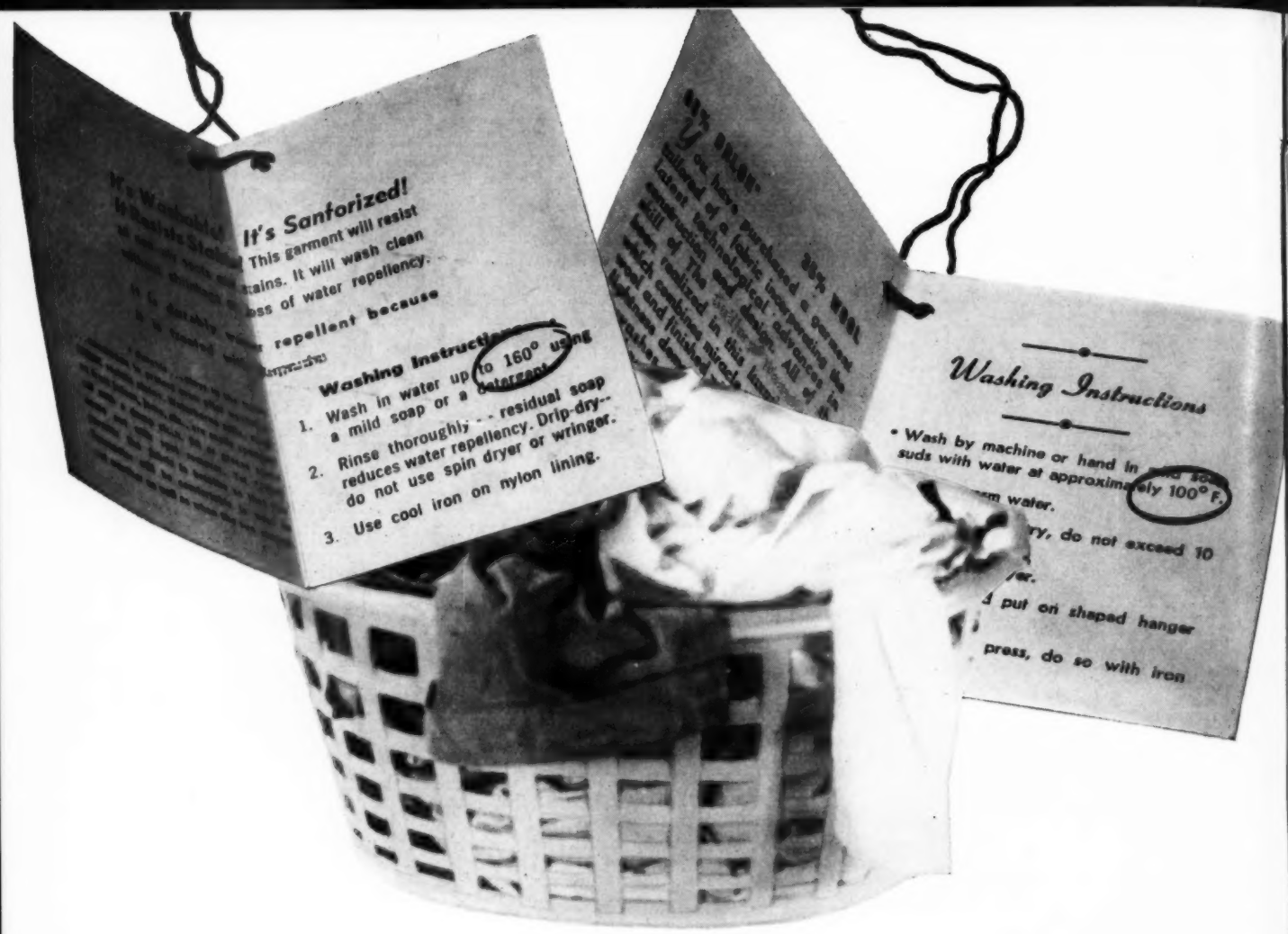
Through an enviable combination of creative engineering and manufacturing skills—plus modern fabrication and finishing techniques, Union Steel remains the *one experienced source* that guarantees higher quality—at lower costs . . . and on-time deliveries.

Remember, too, that Union Steel is conveniently located in the practical geographic "center" of the major appliance manufacturing industry . . . with four large, superbly equipped plants and facilities to serve your needs more efficiently.



Aerial views of Union Steel's four big Albion plants . . . containing the industry's most modern wire-forming and in-plant finishing facilities . . .
All of which are AT YOUR SERVICE.

UNION STEEL PRODUCTS CO.
Contract Wire Division
ALBION, MICHIGAN


It's Sanforized!
Washing Instructions
1. Wash in water up to 160° using a mild soap or a detergent.
2. Rinse thoroughly - - residual soap reduces water repellency. Drip-dry-- do not use spin dryer or wringer.
3. Use cool iron on nylon lining.
Washing Instructions
• Wash by machine or hand in
suds with water at approximately 100° F.
water.
put on shaped hanger
press, do so with iron

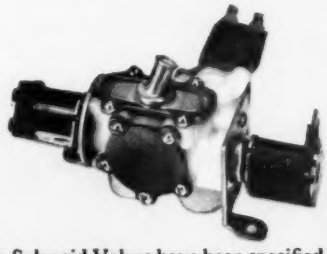
HOW TO "TAG" A MARKET TREND FOR INCREASED PROFITS WITH DOLE THERMOSTATIC CONTROLS

Now is the time to get set for the rapidly rising demand for thermostatically controlled automatic washers. Dole engineers can help you tag this trend for a healthy profit.

What's the new impetus behind the switch? As your own Home Economist will confirm, textile mills are now tagging all fabrics to denote exact type and percentage of natural and synthetic fibres. Manufacturers are labeling garments and adding specific washing temperature instructions best suited to the particular fibre or combination. Consumers are rapidly being educated to the direct relation between a garment's service life and proper washing temperatures.

Result: An increasing demand for washers with positive thermostatic control of water temperature over a wide range of selectivity.

Providing controls to meet the most exacting and versatile requirements of the appliance industry is what has made Dole a leader in the field of water and temperature control. So why not check with our engineering department now through the Dole field engineer who calls on you regularly. There's an excellent chance he'll be able to help you put a "Sold" tag on a lot of future orders by helping you design and build in a Dole Thermostatic control.



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Control with

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